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CITY HEALTH ADMINISTRATION

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CITY HEALTH ADMINISTRATION

BY

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NATIONAL INSTITUTE OF PUBLIC ADMINISTRATION AND NEW YORK BUREAU OF MUNICIPAL RESEARCH

New York

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PREFACE

From earliest times all commentaries on government have declared the preservation of the public health to be one of the most important objects of public administration. Yet in spite of this obvious truth, and the fact that no field of public service affords greater opportunity for the cultivation of citizen interest and coöperation for the public welfare, there are few branches of government work about which laymen are less capable of forming intelligent judgments. There is a growing appreciation of the individual's responsibility for his own health maintenance, thanks to popular health education, but what the government health agency should do for public health betterment, and how it should be organized and administered for the purpose, are subjects on which a great deal of educational effort must yet be spent.

One would naturally think that a subject of such basic importance in the government program would have a prominent place in the curricula of all schools above the elementary rank, but this is, unfortunately, not the case. Even in those schools where courses in government are featured, the subject of public health administration is rarely dealt with except in a very sketchy way. Outside of the few special schools for the professional training of health officers and sanitarians, the number of well-organized courses in public health administration are few indeed.

Since 1912, the author, a member of the staff of the New York Bureau of Municipal Research and Training School for Public Service, has been engaged in making surveys of state and local health administration, and in contributing to the instruction of several hundred teachers and students of government on these subjects. Of the teachers and students of government who, during the past ten years, have come to the Training School for Public Service from colleges and universities in this country and abroad for special study of public administration, not more than a dozen are remembered as having more than the merest smattering of information about public health practice. The great

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majority of these Training School students were seeking to fit themselves for broader opportunities in teaching, in public service, or in other work where greater knowledge of government administration was to their advantage. To find among this group of postgraduate students of government so few who were familiar with official health practice indicates how small a place this subject has in the general educational program. If men and women, who have taken intensive courses in government, are no better informed about this important function of government, what can be said of those teachers, students, public officials, and other citizens who have had no such educational opportunity.

Most of the standard works on public health administration have been designed as manuals of public health technique and procedure for professional workers. Such manuals cannot, therefore, serve satisfactorily the needs of the person without professional training or experience, whether he is a teacher or student of government, a public official, or merely the "man in the street" who wants to know what health benefits he should have for his tax payments. It is a proper criticism, perhaps, of this volume that it is elementary in its treatment. It is our experience that such treatment is necessary if the book is to be most useful to those interested in government, who are still in the elementary grades as far as their knowledge of public health work is concerned. In the preparation of this book we have, therefore, tried to keep the layman's viewpoint in mind.

There are many important problems of city health administration which deserve much more comprehensive treatment than could possibly be given them here. The references throughout the text and in the appended bibliography have been designed to fill the gaps in our discussion and have been selected, not because they are necessarily the best reference sources, but rather because they are the best sources ordinarily available to general readers in the libraries to which they have access. The vast amount of material on public health can scarcely be thoroughly examined even by those who have no other business but the review of health literature. In our own teaching, we have found it futile to burden the student with lists of references on technical subjects which are neither readily obtainable nor quickly and easily reviewable.

The author has drawn extensively upon the reports of surveys of municipal health work made by the New York Bureau of

Municipal Research during the past fourteen years. These citations from survey reports are, in many instances, frankly critical of health administration in the cities named. They are used simply "to point the moral and adorn the tale," not to suggest invidious comparisons of municipal health departments. The criticisms should be viewed by the reader as of the past, and proper only in the circumstances existing at the time the surveys were made. In many of the cities surveyed, the conditions cited would not be found to-day. The citations should not, however, be regarded as illustrating unusual or atypical situations of a past decade; they are as characteristic to-day of public health practice in other cities as they were formerly in the cities specifically mentioned.

The author has been particularly fortunate in having as his associates, a group of men and women who may properly be called specialists in the various fields of public administration. In a large sense the book is the product of this group rather than of the individual whose name it bears. Whatever commendation it may receive, the author is happy to share with his coworkers. For its many defects, the former is responsible. To A. E. Buck, who edited the manuscript and offered a great deal of much needed criticism on its contents and structure; to Sarah Greer who gave unsparing effort to the review of reference material and the preparation of the bibliography; and to Harriet Katz who helped finally to prepare the manuscript for publication, the author is particularly grateful.

Carl E. McCombs.

261 Broadway, New York City.
March, 1927.

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PART I

MUNICIPAL HEALTH FUNCTIONS

CITY HEALTH ADMINISTRATION

CHAPTER I

MUNICIPAL HEALTH ACTIVITIES

The activities of a municipal government for the protection and maintenance of the health of its citizens fall naturally into two groups. The first group comprises those activities for which the municipal government is held responsible as an agent of the state. These are for the most part regulatory activities which the local government carries on under special mandate of state law. The second group comprises all other health activities which may be undertaken voluntarily by the community within the limits of the general authority granted by the state.

Although state laws vary widely in the degrees of responsibility conferred upon municipal governments for the health of their citizens, there is, on the whole, a marked uniformity with respect to the nature of the regulatory or mandatory health activities carried on by them. Practically all states recognize the necessity of delegating to city governments authority and responsibility for the registration of vital facts about sickness and death; the control of diseases "dangerous to public health"; the sanitary supervision of food, water, and environmental conditions which may promote the spread of disease or lower resistance to it; the protection of the health of children, particularly during the period of public school life; and the care of the sick and infirm who, as dependents, are properly wards of the municipal government.

With respect to the voluntary obligations for health protection and maintenance which may be assumed by the community there is much less uniformity. The community may do whatever it considers necessary for its own protection, provided that in so doing it does not exceed the powers granted it by the state. It may build and maintain hospitals and sanatoria for the sick of all classes, dependent or not, provide special services in aid of mothers and children, and carry on health educational work of all kinds. These voluntary or optional activities of municipal governments are designed to fill the gap which exists

between the satisfaction of the health needs of the individual members of the community and the health protection of the community as a whole for which the state holds the local government directly responsible. It is obvious that the government is limited in its authority over the conduct of the individual except when the public health may be endangered by his action. The government cannot, under ordinary circumstances, compel the individual to provide for his own health betterment, or that of his family, as long as he does not criminally neglect the welfare of his wards or dependents. However, the municipal government can, and should, provide for the health education and instruction of the individual, and for furnishing health aid to those who need it and would otherwise be incapable of obtaining it.

The Development of Municipal Preventive and Curative Health Services

It will be noted in the above brief outline of the mandatory and voluntary health activities of municipal governments, that the problem of community health maintenance has two chief phases. The first and most important is the prevention of sickness; the second, the treatment or cure of sickness in those who cannot adequately provide such care for themselves. The prevention of sickness and the treatment of sickness are naturally closely related, and particularly so in the case of activities for the control of communicable diseases. In order to prevent the spread of communicable diseases the government must, in many instances, take charge of the treatment of patients. The purpose of the government is not primarily to cure the sick persons, however important that may be to the individuals themselves, but rather to protect other persons from infections which the sick persons might, if untreated, convey to others.

The prevention of sickness, as it is understood to-day, is a much more modern phase of municipal health work than the cure of sickness. Many of the elementary principles of sanitation were undoubtedly quite well known to the ancients, although it is not probable they had anything more than experience to guide them in their judgments on disease prevention. They knew that sickness was spread by human contacts and by failure to dispose properly of human wastes, but the nature of disease-causing bacteria, how they grew in the body, and how they were borne from person to person, was not then a part of human knowledge.

In all ages and among all peoples there has been a constant effort to prevent disease; but lacking the knowledge that disease was, in most instances, due to the presence in the human body of living organisms, efforts to combat it were not marked with great success prior to the nineteenth century. The epidemics which ravaged all Europe during the Middle Ages testify to the impotence of the people and their officials either to prevent or control communicable diseases. A classic description of one of these great epidemics, that occurring in London in 1664 and 1665, is found in *A Journal of the Plague Year* by Daniel Defoe, the famous English novelist. This journal presents a vivid picture of the heroic effort of a city to protect itself against a visitation of disease about which there was little known except that it struck with no warning, spread with lightning-like rapidity, and was fatal in the extreme.

To-day the causes of most of the communicable diseases are known and their modes of transmission so well understood that such widespread epidemics are almost a thing of the past. But when large numbers of people are stricken by rapidly spreading and fatal sickness about which modern sanitary science has not disclosed the facts necessary for its control, the people are scarcely more competent to protect themselves than they were three hundred years ago. In the last great epidemic of influenza which reached its height in the latter part of 1918 and resulted in the immediate death of hundreds of thousands of people, and the later death of many thousands more, proclamations were issued, drastic regulations enforced, this preventive and that preventive advised, and scenes enacted quite like those of the London "plague" epidemic of two hundred and fifty years before. The germ cause of the disease called influenza was not fully identified, how the disease spread was not clearly understood, and how to control it was a problem for which there were almost as many solutions suggested as there were communities attacked.

Fortunately, there remain few communicable diseases prevalent in this country which cannot be held within bounds by the application of known and proven regulatory measures. Nearly all the activities for disease prevention which are to-day recognized as of essential importance are, however, of comparatively recent development. A span of about fifty years represents the period of the general application in disease control of the discoveries of bacteriological science regarding the causes and modes of trans-

mission of communicable diseases. The demonstration by Pasteur in 1866 and 1867 in his studies of the disease anthrax, that a germ was the sole cause of this disease, laid a solid foundation for the "germ theory" on which modern disease prevention work is based. Prior to 1885, however, relatively little had been done in this country either to apply the principles of the study of bacteria laid down by Pasteur, or to utilize the bacteriological laboratory as a first aid to efficient public health service. But since 1890, American bacteriologists have made many and valuable contributions to sanitary science and public health practice.

There were a few scattered municipal health departments in existence in this country during the latter part of the eighteenth and the beginning of the nineteenth centuries. Philadelphia had a board of health in 1794, New York in 1796, Boston in 1799. According to a report made by the American Public Health Association in 1873 on health administration in about a hundred communities, only five established health boards between 1800 and 1830, and between 1870 and 1873 there were only thirty. But with the establishment in 1869 of the Massachusetts State Board of Health, the first to inaugurate a comprehensive program of disease prevention, the organization of state boards of health proceeded rapidly and had a most beneficial effect upon the expansion of local health services. To-day, there is no state or city which has not an official organization of some kind for the prevention of disease, although many such organizations are still quite limited in the scope of their activities.

The most striking thing about the growth of municipal health service in this country is that in a little more than fifty years it has attained such remarkable results in the prevention of diseases which formerly ravaged all communities. Many diseases which once were considered to be almost as inevitable as death itself are now well on their way to complete elimination. The preventable deaths in our best organized communities have been reduced by half, and the span of life has been lengthened many years. This has come about in a period of development of municipal government in America which James Bryce, the English statesman, characterized thus:

> There is no denying that the government of cities is the one conspicuous failure of the United States. The deficiencies of the national government tell but little for evil on the welfare of the people. The faults of state governments are insignificant compared with the extrav-

agance, corruption, and mismanagement which mark the administration of most of the great cities. For these evils are not confined to one or two cities. There is not a city with a population exceeding 200,000 where the poison germs have not sprung into a vigorous life; and in some of the smaller ones down to 70,000 it needs no microscope to note the results of this growth. Even in cities of the third rank similar phenomena may occasionally be discerned.[1]

What Bryce wrote in 1896 certainly does not picture to-day's conditions in American cities. While there is still mismanagement, extravagance, and corruption of public health service in a few places, in the majority there is real and measureable progress toward the health ideal of sickness prevention, and the greatest progress in municipal organization to this end has taken place in the largest cities where the hampering influences, noted by Bryce, were at their worst.[2]

Sickness Preventive Functions

As pointed out, the development of scientific methods of disease prevention had to wait until bacteriological research had shown the way. So it was not until 1880, and later in many cities, that the organization of municipal sickness prevention services exhibited any particularly significant features. With the beginning of real study of the causes of disease and the adoption of measures for disease control which such study indicated, municipal health work, about 1900, entered upon a period of rapid expansion and specialization. Special health units were established by municipal governments to deal particularly with control of communicable diseases; other units were created for child health work, which began to be recognized as a primary public responsibility. As the result of laboratory findings, milk was found to play an important rôle in transmitting disease, and inspection units were established for the regulation and control of milk production, handling, and sale. The enactment of the Federal Pure Food Act, in 1906, gave added stimulus to the inauguration of better methods of food control generally. The Federal Meat Inspection Act, passed in the same year, further hastened the development by municipal health departments of

[1] James Bryce, *The American Commonwealth* (abridged edition), 1923, p. 429.

[2] M. P. Ravenel, Editor, *A Half Century of Health Administration*, published by The American Public Health Association, 1921.

special divisions for meat inspection. - Vital statistics research prior to 1900 was limited in the main to a few of the largest cities, and even as late as 1910 less than 50 per cent of the population of the country was included in the registration area for births and deaths as approved by the United States Bureau of the Census. This bureau has been responsible, however, for stimulating the development of standards of vital statistics work which were rapidly adopted by the cities.

In the decade following 1900, the expansion of these highly specialized health services was most rapid, and it became apparent to able health executives everywhere that to secure best results a new type of health organization was needed. So municipal health departments organized bureaus or divisions of vital statistics, child hygiene, communicable disease control, food inspection, and sanitary inspection, designed to bring together related activities in these fields. This grouping of related activities of great variety into more or less well-defined units of health organization for sickness prevention is characteristic of practically all municipal health departments, although there are naturally many variations in the plan of grouping. Such an arrangement is called a functional organization. Used in its broadest sense, the "function" of a public health service is to promote community health. In its narrowest sense, a "health function" is any activity, great or small, which contributes to the general purpose of community health promotion. The term health function is, however, ordinarily used as applying to certain major purposes or lines of sickness prevention work as, (1) vital statistics registration, (2) prevention and control of communicable diseases, (3) protection and promotion of child health, (4) sanitary regulation of food and water supplies, (5) sanitary regulation of conditions of environment generally, and (6) public health information and education. Regardless of the size or character of a community, the general organization of its government, or the special organization for health work, these functions must be performed if sickness is really to be prevented.

Sickness Treatment Functions

The rapid development of municipal health work for sickness prevention during the past fifty years has been paralleled by a similar expansion of public services for the treatment of the sick. In 1873, there were less than 150 hospitals of all kinds in this

country, with a total of about 35,000 beds. In 1924, there were over 6,700 hospitals, with more than 750,000 beds. In this fifty-year period, while the population of the country increased about 175 per cent, the number of hospitals of all kinds increased over 4,000 per cent, and the number of hospital beds over 2,000 per cent.

In this country, as in other countries, the major share of the burden of caring for the sick, except those suffering with diseases "dangerous to public health," has always been borne by private philanthropy. The maintenance of "pest houses" or "lazars" for the isolation of persons having dangerous communicable diseases has been, from very early times, recognized as the responsibility of towns and cities, but until the latter part of the nineteenth century few such institutions were entitled to hospital rank. Including hospitals for communicable diseases only, about 9 per cent of the more than 6,700 hospitals of the country in 1924 were city owned.

This increase of hospital facilities was further accelerated by the discovery of the tubercle bacillus by Koch in 1882, which set in motion the modern campaign against tuberculosis. The need of special hospitals, sanatoria, dispensaries, and other agencies for the care of the tuberculous was at once apparent, and their establishment proceeded rapidly. Except in the largest cities, however, hospital and sanatorium care of the tuberculous is provided by agencies other than the municipal government, as state and county governments and private anti-tuberculosis associations.

The dispensary, which has come to be one of the most important elements in community organization for health, had its modern origin in London in 1696, when a group of physicians formed an association to purchase and dispense medicine to the sick poor. The first dispensary in this country was established in Philadelphia in 1786. New York in 1790, and Boston in 1796, followed Philadelphia's lead. In 1800, only these three dispensaries were in existence, and during the next century only about a hundred more were established. These early dispensaries were for the most part just what their name indicates, that is, places where medicines were dispensed to the sick poor, and most of them were maintained by private agencies. It was not until after 1900 that dispensary service began to show any marked changes in character, and to approximate the definition now accepted as embodying dispensary purpose: "A dispensary is an institution which

organizes the professional equipment and special skill of physicians for the diagnosis, treatment, and prevention of disease among ambulatory patients." [3]

In the development of dispensaries also, city governments have had relatively little share, since the great majority of dispensaries were, and still are, maintained as special units of general hospitals under private management. As the work of municipal governments in sickness prevention has been expanded during the past twenty years, public health officials have found, however, that the treatment of the tuberculous and the venerally infected is an indispensable factor in the prevention of these diseases. In consequence, many municipal governments have found it advisable to maintain special dispensaries for tuberculosis and venereal disease under their own control. The treatment of children's diseases, and physical and mental defects of children is now also recognized as an essential feature of any well-organized program of child hygiene, and in this field of dispensary work, municipal health departments have taken over many of the responsibilities for the treatment of children, formerly provided only by private agencies. In only a few cities, however, are adequate dispensary facilities for all classes of ambulatory sick provided by the city government, and where so provided, the service is commonly limited to public dependents.

Home care of the sick poor by physicians employed by the city government antedates hospital care in many cities. Lacking adequate public hospital and dispensary services, a private practitioner was engaged by the city to provide medical care of all dependent sick who were properly charges upon the community, and for whom other medical care was not available or suitable. The "poor physician" still has his place as an aid to community health maintenance, but the tremendously increased sickness treatment facilities of hospitals, dispensaries, sanatoria, and other agencies, public and private, have greatly limited the field of his activities.

The most recent development in the field of sickness treatment is the convalescent home or hospital for adults and children who are on the verge of sickness or recovering from it. Most of these institutions have been established during the past ten or fifteen years by private philanthropy. The need for them in the large

[3] Michael M. Davis and Andrew R. Warner, *dispensaries, Their Management and Development*, 1918, p. 27.

cities is, however, so apparent it is probable that within the next twenty-five years, they will be recognized as distinctly municipal enterprises to be supported from public funds.

It is impossible to say to what extent any given community should go in providing for the treatment of the sick. Many of the services required by cities are provided by their state and county governments and are used and paid for by the cities according to need. Institutions and agencies for treatment of the sick of great variety are provided by private agencies under their own control and made available for the care of public charges at the expense of the city government. We may, however, define the major functions of municipal government for the treatment of the sick as follows, regardless of what agencies, public or private, may be in control of the services concerned.

1. Hospital care and treatment of the dependent sick or disabled generally, who are properly public charges.

2. Hospital care and treatment of those suffering with readily communicable diseases whether public dependent or not, who cannot otherwise be adequately controlled for the protection of the public health.

3. Special hospital care and treatment of tuberculous patients for whom other hospital, dispensary, or home treatment services are not available or suitable.

4. Care and treatment in public dispensaries of the dependent sick generally, who do not require hospital care, *i.e.* ambulatory patients.

5. Care and treatment by home visiting physicians and nurses of the dependent sick who are unable to take advantage of hospital or dispensary facilities.

6. Care and treatment in convalescent hospitals of those dependent persons who are on the verge of sickness or convalescing from sickness whose needs cannot be met adequately by other medical services.

CHAPTER II

THE PLACE OF MUNICIPAL HEALTH SERVICE IN THE FIELD OF PUBLIC WELFARE

We have previously indicated that the municipal care and treatment of the dependent sick, which we have here considered as part of public health work, is closely identified with other phases of the administration of poor relief. But the relationship between health and poverty goes deeper than this. Prevention of poverty is necessary to prevention of sickness. An analysis of the causes of public dependency as they are set down in the records of official and unofficial poor relief agencies, furnishes striking evidences that sickness is overwhelmingly the most common and the most serious cause. Even where the immediate cause of dependency is apparently other than sickness, careful inquiry into the history of the dependent and his family often reveals that sickness was a contributory or predisposing factor in the situation. But sickness is not only a cause of public dependency; it is often the result of it. The individual or family—lacking even the bare necessities of food, clothing and shelter, and burdened further with the mental distress incident to such circumstances—is much more susceptible to disease and less capable of resisting disease when attacked. Preventing disease, prevents dependency; preventing dependency, prevents disease. On this point Sir Arthur Newsholme, the celebrated English authority on public health administration, says:

It is unnecessary to argue here the question as to the relative importance of poverty and disease in the production of social misery. Beyond doubt, each may, in any practical sense of the word, cause the other, but I record my own opinion that disease much oftener causes poverty than poverty disease. Poverty probably causes less disease through actual privation than it causes through uncleanliness and crowding, through ignorance of the ways and means that are available even to the poverty-stricken, and often through alcoholism. It is, of course, immensely more difficult for the poor than for the comfortably circumstanced to avoid these evils. That poverty and

disease work on each other in a vicious circle is obvious. But this circle has the quality of its defect, for the circle can be broken at any point; and the practical problem in a high proportion of the total cases of poverty is concerned with the means by which it may be possible to stop people from becoming poor by preventing them from becoming or remaining sick. This is not the only way in which the problem of poverty can and ought to be attacked; but this mode of attack has not received the attenion that it deserves and it is a method which will yield a higher and a quicker return for the energy and money required than others which at present are more in the public eye.[1]

In this connection, it is proper to consider also another phase of the municipal government's responsibility which has an important place in the disease-dependency prevention program, if we may call it so. We refer to the prevention of delinquency, and particularly juvenile delinquency. Dependent persons placed in circumstances which make life and living difficult and unhappy, and denied many of the social, recreational, and educational advantages of the economically efficient, are less capable on the whole of adjusting themselves to ethical society and, therefore, do not feel many of the inhibitory influences which restrain the members of ethical society from anti-social acts. While it cannot be said that physical or mental defect and dependency are necessarily causes of delinquency, many competent observers offer convincing evidence that the ranks of juvenile delinquents, at least, are recruited largely from those who are physically or mentally handicapped and from that great group of "dependent and neglected children" to whom proper home supervision and discipline have been denied because of the economic incompetence of the head of the family. It is also true that the delinquent contributes materially to the spread of disease, especially venereal and drug addiction diseases, and so the vicious cycle of the three d's, disease, dependency, and delinquency, may be fully established.

Since this relationship between disease, dependency, and delinquency is inescapable in urban life, it would appear highly desirable that the forces of municipal government should be so organized that health services and other services for the prevention and relief of social misery can be integrated in a common program. The question of how such organization can best be developed

[1] Sir Arthur Newsholme, *The Ministry of Health*, 1926, p. 166.

in a given community will depend naturally upon the nature and extent of the special services needed and upon the general structure of the municipal government. But before considering the various types of administration of health and welfare functions to be found in American cities, it is desirable to have clearly in mind what is meant by "public welfare."

Public Welfare Services Defined

The term, public welfare, has come into general use in the past decade as a more complete expression of a concept earlier defined as "charities and corrections." Just as the public health purpose has changed in character from one designed to meet emergency health dangers to one completely equipped to anticipate and prevent the immediate as well as the remote health dangers, so the community attitude has changed toward its responsibilities for the dependent, the defective, and the delinquent. The old idea that the community's responsibility was limited in the main to relieving the immediate necessity of the dependent or otherwise incompetent person, and controlling the individual delinquent, has given way to the new idea of preventing conditions which tend to produce these community liabilities. The thought is well expressed by an authority in this field:

> Public welfare aims to be a definite service of democratic government, along with public health, public education, and public protection. While caring for those who have become public charges, it strives to effect efficient methods for rehabilitating the down and out, for equalizing opportunity for the socially unfortunate and deficient, for preventing individual and family disaster, and for building up a wholesome community atmosphere.[2]

Where responsibility for the maintenance of the great variety of services for the public welfare should be lodged, and how their activities should be carried out, are questions which cannot be discussed in detail here. The reader is referred particularly to the volume from which the foregoing quotation has been taken for a well-rounded discussion of this matter. The city government's responsibility for public welfare services of the type described depends, of course, first, upon what may be its obliga-

[2] H. W. Odum and D. W. Willard, *Systems of Public Welfare*, 1925, p. 248.

tion under state laws, and second, upon what the community may endorse and support at public expense, beyond the strict legal obligations imposed by the state.

Under the general state laws, municipal governments are commonly required to provide for the care of dependent and otherwise incompetent adults and children within their jurisdictions. This means furnishing when necessary, at public expense, shelter, food, fuel, clothing, medical relief, and other care in family homes or in institutions. With respect to delinquents, the municipal government's responsibility is not so clearly or uniformly defined in law. Usually the care and custody of delinquents is finally provided by state or county governments, and the municipal government's obligation, if any, is chiefly that of temporary detention and supervision of such persons. The same is true of those who are suspected of being mentally incompetent; facilities for their temporary detention and observation are provided by municipal governments, but those found insane are transferred to the custody of the state. The program of public welfare which the community may carry on of its own initiative includes then the maintenance of agencies and institutions of all kinds for the care and supervision of the physically, mentally, or otherwise incompetent. It may also provide for recreation and entertainment by parks and playgrounds, public baths, and swimming pools, concerts, and entertainments, summer camps for mothers and children, research and investigational agencies of various kinds, and other special services designed to make community life more enjoyable and profitable.

Types of Municipal Government and Their Nature as Affecting Health and Welfare Organization

Having in mind the general nature of the health and welfare program of the community which may be carried on under the auspices of the municipal government, let us consider the various types of health and welfare organization to be found in existing practice. These may be described as follows, depending upon the general structure of municipal government.

Under the older mayor-council form of government, each unit of government representing a special group of health and welfare functions is usually administered independently by a board, commission, or single officer responsible directly to the mayor as head

of the government. There is, perhaps, a board or commissioner of health responsible for sickness prevention only, or sometimes, also, for certain hospital and other services for the care of the sick and infirm. In many instances, the latter services are independently directed by a hospital board or hospital superintendent. There is an overseer of the poor, charities commission, or commissioner, responsible for administering public relief generally in institutions and otherwise. There may be a child welfare agency under an independent board or commissioner which deals with all, or special, phases of the problems of dependent, neglected, and delinquent children. Recreational and other like services for the public welfare may be, and usually are, under the direction of one or more boards or commissioners. Each agency functions more or less independently and such coöperative action as may be developed is dependent chiefly upon the personal relations of the authorities concerned and their official control by the mayor.

Under the commission plan, responsibility for the general administration of the various services of government is divided among the city commissioners. The usual practice is for one of the commissioners, variously designated as commissioner of public affairs, public safety, or public welfare, to take administrative responsibility for all or the greater part of the health and welfare agencies or institutions and to coördinate their work as far as it is possible to do so without interference with their independence as to technical management. He may find it desirable to effect certain consolidations of related service units so as to reduce the number of responsible executives under his control; commission government charters commonly give the commissioners as a body, authority to make such consolidations. From the point of view of developing an integrated health and welfare service, the commission form of government offers, therefore, certain practical advantages. It tends toward administrative consolidation of related functions and the elimination of duplication and overlapping of work, by focusing the attention of one member of the commission upon health and welfare problems only. When a mayor stands alone at the head of the government, it is practically impossible for him to give to these matters the direct supervision which they need because of the many other important matters which press for his attention.

A third type of organization of health and welfare services is found in the manager form of city government. Here we

have a small city council generally responsible for the development of government policy and program, with an executive or city manager to direct the work. It is in this type of government that the trend toward coördinated health and welfare work has shown greatest progress. The city manager, in order to carry out the city council's program most effectively, finds it desirable to consolidate the various special services of government under the fewest possible responsible officials. The greater the number of special boards, commissions and directing officers, the more difficult it is for the city manager to secure harmony and team work. So it is in this type of government that one finds the best illustrations of coördinated central direction of health and welfare services in a department of public welfare. Several such departments of public welfare will be later described.

It must not be understood that the form of organization of health and welfare services is necessarily determined by the type of municipal government under which they are carried on. The reason why commission and city manager governments show a closer integration in organization of health and welfare functions is that the primary purpose, where these types of government have been adopted by charter amendment, has been to provide for centralization of administrative responsibility and control of all public services. This can be done by charter revision much more completely and satisfactorily than by piecemeal reorganization of government through special legislative enactments. The extent to which cities may go, or should go, towards administrative consolidation of health and welfare functions, whatever the type of government, is of course to be determined not alone by what is permissible under the law, but by many other conditions of peculiarly local bearing.

In small cities, chiefly those under 100,000 population, whose health and welfare needs can be simply met by relatively few municipal agencies working harmoniously together even though under independent direction, it would be quite unnecessary and, perhaps, undesirable to attempt their administrative consolidation. In larger cities where, as usual, the most serious health and welfare problems present themselves and where, in order to solve them, a great number and variety of special agencies are needed, administrative consolidation is desirable within certain limits in order to prevent duplication of effort and consequent waste of public money. There is, of course, such a thing in large cities as

having a too highly centralized direction of health and welfare services. The administration of these functions under conditions of centralized control which would result in too great detachment of the directing authority from intimate contact with actual work in the field, might easily hamper rather than expedite community coöperation.

Illustrations of Health and Welfare Organization in Large Mayor-Council Cities

Most of the great cities of the country still adhere to the mayor-council form of government which, as we have said, is generally characterized by the lack of administrative coördination of related health and welfare functions. In New York City, for example, there are four major independent departments of government dealing with these matters, namely, the department of health which is chiefly responsible for disease prevention activities, including several hospitals for communicable diseases; the department of Bellevue and Allied Hospitals which administers a group of general hospitals for the indigent sick; the department of public welfare which provides for the care of other dependents and incompetents in hospitals, homes for the infirm, and other institutions; and the department of correction which administers several institutions for adult and juvenile delinquents. Several miscellaneous welfare services, such as recreation, public baths, public entertainments, etc., are administered by other independent agencies. Efforts to bring about consolidation of all of these departments and other agencies have received little public support, although several studies have been made of the situation with that purpose in view. The chief objection to their administrative consolidation is that the resulting department would be too unwieldy. A recent proposal to put all public hospitals of the city, except those of the department of health, under the control of the department of public welfare as a next logical step toward the development of a coördinated health and welfare program, has received the endorsement of the best informed people of the city.

In Philadelphia, an organization has been developed which coördinates municipal sickness preventive and curative functions in a department of health with a bureau of health and a bureau of hospitals. An independent department of public welfare con-

tains bureaus of recreation, charities and corrections, personal assistance, and legal aid, and provides for institutional and non-institutional care of certain dependents and delinquents.

Detroit has a health department for the customary disease preventive services, including several hospitals for communicable diseases. A welfare commission administers other activities for the relief of dependent persons, including a general reception hospital, medical care of the sick in their homes, an employment service for the physically handicapped, and performs a great variety of other work for public welfare betterment. A house of correction is maintained under independent administration, and a recreation commission is in charge of playgrounds and recreation centers.

In Boston, a health department provides for disease preventive services generally. A hospital department administers a city hospital and several other institutions for the care of the sick of all types. An institutions department administers the Boston almshouse and hospital, a special child welfare division, a correctional institution, and a number of other services for adult and child dependents and delinquents. An "overseeing of the public welfare department" carries on outdoor relief work among the poor and administers a "temporary home" for destitute women and children, and a "wayfarers' lodge" for homeless men. Recreational and other services, sometimes included under the head of public welfare, are administered by a number of independent agencies.

Chicago has a health department which carries on all of the essential activities for disease prevention and administers the municipal contagious disease hospitals. The city physician is an independent officer who, with his assistants, cares for the sick poor in their homes. The department of public welfare administers a house of correction, including a hospital and farm colony, and carries on a number of other special investigational activities in connection therewith. The administration of playgrounds, bathing beaches, and other like services is provided by a department of public works.

As indicated by the foregoing illustrations of practice in large cities under the mayor-council type of government, there is very little uniformity as to administrative practice. Health activities for disease prevention are usually administered by a department

of health which sometimes includes some of the hospital services. Other public welfare activities are not as a rule administered as a unit but by several independent departments. Much the same situation is found in other cities under this type of government.

Health and Welfare Organization in Commission and Manager Cities

In commission government cities it is usual, as we have said, to find health and welfare activities grouped for purposes of administration under one member of the commission, as a commissioner of public affairs. He may have other activities of various kinds under his direction, but the health and welfare group represents his chief concern. Each special service in this group may be quite independent as to its technical management, but there is a decided tendency toward coördination of program, because administrative responsibility for the health and welfare service group is centered in one commissioner who, unlike the mayor in the mayor-council form of government, can give his attention more directly and purposefully to the group problems.

This type of government represents, in the main, an intermediate stage between the older mayor-council form and the more recent manager form. There are in the neighborhood of 500 American cities operating under the commission plan with only a few of them above 100,000 population. The great majority of the commission governed cities have less than 25,000 population and their health and welfare activities present, therefore, no serious questions of organization. Among the larger cities of this group are Newark and Camden, New Jersey, and Buffalo, New York.

In Newark, the department of public works under the direction of one of the city commissioners has charge of all health and welfare services which include the independently managed units for public health, city hospital, city homes, public baths, the almshouse, outdoor poor relief, public outings, band concerts, and other entertainments, free dental clinics, and convalescent care. It should be said here that the Newark department of public works is responsible for the administration of activities which are not "public works" in the usual understanding of the term.

In Camden, health and welfare activities are brought together in a department of public affairs under the mayor who is commissioner of public affairs. The city controlled health and welfare agencies, included under his general direction as independently

managed units, are public charities, public health, the municipal hospital, and "publicity and public welfare." This last named service is chiefly home visitation and education of parents in the care of children.

In Buffalo, there is a somewhat different alignment of health and welfare services. The city commissioner who administers the department of public safety has under his direction, along with police, fire, public markets, and other miscellaneous services, the public health agency for disease prevention and the general hospital for the care of the indigent sick. A bureau of public welfare which is responsible for institutional and other care of dependents, a bureau of industrial aid, and veterans' relief are grouped in a department of public affairs under another city commissioner.

In other commission governed cities somewhat similar groupings of related health and welfare activities are found. The inclusion of health and hospital services in the department of safety, and other welfare activities in a department of public affairs, as in Buffalo, is less common than the administration of both activity groups in one department as in Newark and Camden. The only significant feature of health and welfare organization in commission governed cities is this grouping in one way or another of independently managed, but related service units under the direction of one member of the city commission.

There are over 300 manager governed cities and these, also, are chiefly in the class under 100,000 population. Nevertheless, in these cities one finds the best illustrations of coördinated health and welfare service. Among the larger cities of this group are Dayton and Cleveland, Ohio, and Norfolk, Virginia. In these cities splendid progress has been made toward a well rounded, closely knit health and welfare organization and program.

In the Dayton city charter of 1913, section 67, we find this excellent expression of municipal purpose with respect to health and welfare functions:

> Subject to the supervision and control of the city manager in all matters, the director of public welfare shall manage all charitable, correctional, and reformatory institutions and agencies belonging to the city; the use of all recreational facilities of the city including parks and playgrounds. He shall have charge of the inspection and supervision of all public amusements and entertainments. He shall enforce all laws, ordinances and regulations relative to the preserva- and promotion of public health, the prevention and restriction of

disease, the prevention, abatement, and suppression of nuisances, and the sanitary inspection and supervision of the production, transportation, storage and sale of food and food stuffs. He shall cause a complete and accurate system of vital food and food stuffs. He shall cause a complete and accurate system of vital statistics to be kept. In time of epidemic or threatened epidemic, he may enforce such quarantine and isolation regulations as are appropriate to the emergency. The director of public welfare shall provide for the study of and research into the causes of poverty, delinquency, crime and disease, and other social problems in the community, and shall by means of lectures and exhibits promote the education and understanding of the community in those matters which effect the public welfare.

In Cleveland, much the same plan is in effect, as shown by the accompanying chart. The department of public welfare has a single director who is responsible for the administration of a division of health, the city farm, city infirmary, tuberculosis hospital, city hospital, boys' home, girls' home, correction farm (workhouse), a division of employment, and related activities. The only special services left out of this department which might be described as belonging, in theory at least, in the field of public welfare are those of recreation and municipal entertainment, which are administered in a department of parks and public property. In many cities special problems exist in the management of recreational and entertainment facilities which warrant separation of these functions from the public health and welfare group.

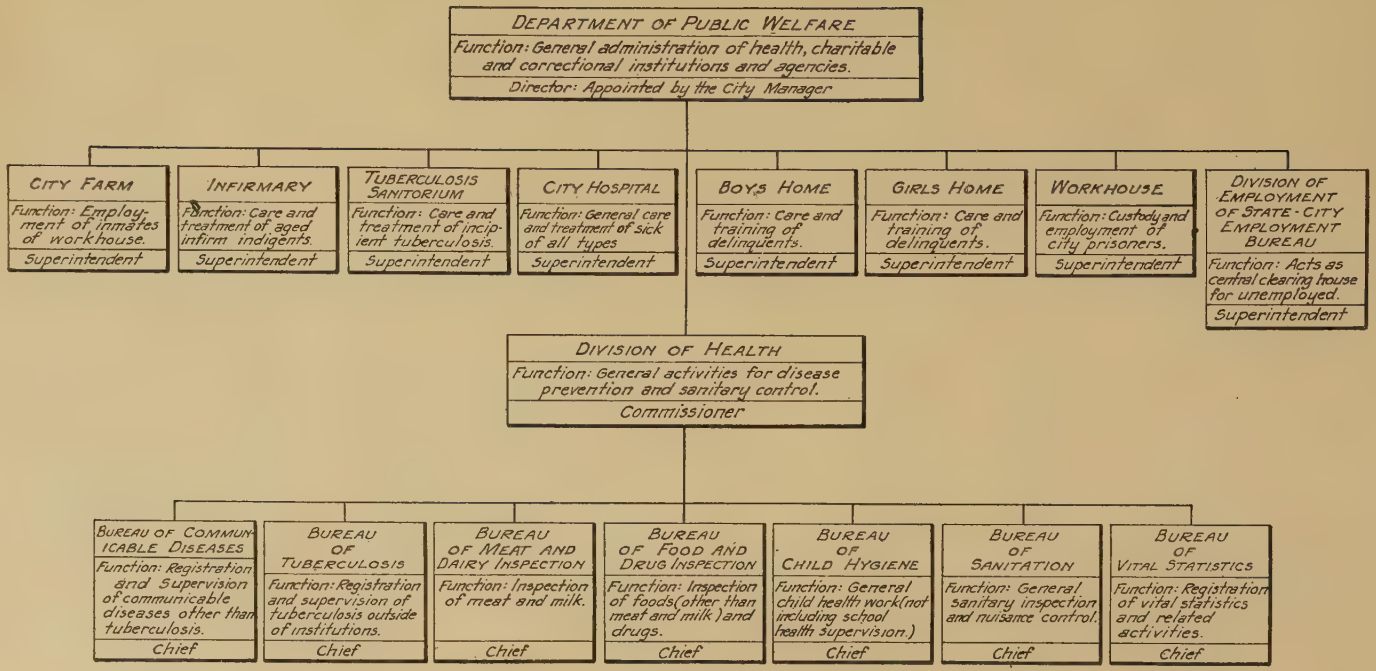
In Norfolk, the department of public welfare, under a single director, administers public health, hospitals, dispensary, public markets, comfort stations, parks and playgrounds, city morgue, municipal cemeteries, home for indigents, and a special unit for "beautifying" the city. Many of these agencies, though having only a remote or indirect bearing upon community health and welfare, have been included in the public welfare group rather because of purely local administrative requirements than because of organizational unity.

General Conclusions with Respect to Health and Welfare Administration

About the only general conclusions that can be drawn from a review of existing practice are:

1. There is in American cities a marked tendency toward the

DEPARTMENT OF PUBLIC WELFARE
CLEVELAND, OHIO


DEPARTMENT OF PUBLIC WELFARE
Function: General administration of health, charitable and correctional institutions and agencies.
Director: Appointed by the City Manager
CITY FARM
Function: Employment of inmates of workhouse.
Superintendent
INFIRMARY
Function: Care and treatment of aged infirm indigents.
Superintendent
TUBERCULOSIS SANITORIUM
Function: Care and treatment of incipient tuberculosis.
Superintendent
CITY HOSPITAL
Function: General care and treatment of sick of all types
Superintendent
BOYS HOME
Function: Care and training of delinquents.
Superintendent
GIRLS HOME
Function: Care and training of delinquents.
Superintendent
WORKHOUSE
Function: Custody and employment of city prisoners.
Superintendent
DIVISION OF EMPLOYMENT OF STATE-CITY EMPLOYMENT BUREAU
Function: Acts as central clearing house for unemployed.
Superintendent
DIVISION OF HEALTH
Function: General activities for disease prevention and sanitary control.
Commissioner
BUREAU OF COMMUNICABLE DISEASES
Function: Registration and Supervision of communicable diseases other than tuberculosis.
Chief
BUREAU OF TUBERCULOSIS
Function: Registration and supervision of tuberculosis outside of institutions.
Chief
BUREAU OF MEAT AND DAIRY INSPECTION
Function: Inspection of meat and milk.
Chief
BUREAU OF FOOD AND DRUG INSPECTION
Function: Inspection of foods (other than meat and milk) and drugs.
Chief
BUREAU OF CHILD HYGIENE
Function: General child health work (not including school health supervision.)
Chief
BUREAU OF SANITATION
Function: General sanitary inspection and nuisance control.
Chief
BUREAU OF VITAL STATISTICS
Function: Registration of vital statistics and related activities.
Chief

From information furnished by The Municipal Research Bureau, Cleveland, O.

consolidation of health and welfare services under fewer administrative authorities, such tendency being more evident in commission and manager governed cities.

2. Making due allowance for purely local factors affecting health and welfare administration, the coördination of all health and welfare services in a single department of public welfare seems to be the ideal toward which municipal government is now progressing.

CHAPTER III

THE ADMINISTRATIVE RELATIONS OF THE PREVENTIVE AND CURATIVE HEALTH FUNCTIONS

From our brief review of current practice in public health and welfare administration, it appears that the health functions of prevention and treatment of sickness are most often organized in one of the three following ways:

1. The sickness preventive functions may be administered by an independent department of health, while the sickness curative functions are administered either independently or consolidated with other services in a general department of public welfare.
2. The preventive and curative functions may be administered together in a department of health.
3. The preventive and curative functions may be administered as a single unit, or as coördinate units, of a general department of public welfare in which other public welfare services are also represented as special units.

It is, of course, impossible to say which of these three types of health administration is best calculated to meet community health needs. Good results in conservation of community health can be obtained under any plan which provides for efficient direction, trained personnel, adequate financing, and coöperation between all service units which have the common health purpose. But, assuming no legal or other practical necessity for the adoption of a given plan of health administration, what plan seems best designed to permit clear definition of responsibility for health results, eliminate duplication and overlapping of function, conserve public money, and guarantee official and unofficial coöperation in the health program?

Should Sickness Preventive and Curative Functions Be Separately Directed?

Regardless of their relationships to other city work for the promotion of public welfare, the question whether sickness pre-

ventive and curative functions should be combined under the direction and control of the health authority, deserves careful consideration. We have emphasized the fact that the prevention of sickness, particularly that due to preventable diseases, is the *sin qua non* of efficient community health protection. We have also said that the municipal authority, which is responsible for the prevention of disease, has a direct interest in the treatment of those persons who are sick with communicable diseases, since their proper treatment is an essential to the prevention of such diseases. It is, therefore, sound administrative practice to place the hospital for communicable diseases under the direction of the health authority. If this were the only public sickness treatment service offered by the city government, the administrative problem would be relatively a simple one. But municipal care of the sick frequently requires the maintenance and operation of a great variety of institutional and non-institutional services which may have little or no bearing upon the prevention of sickness.

In behalf of the consolidation of preventive and curative health functions in the health department, the argument is offered that since both groups of functions have the same basic purpose, namely, the maintenance of community health, it is illogical to separate them as to their direction. Both groups are concerned in one way or another with sickness and to the lay mind, this appears to be sufficient reason for their unified direction. But there are certain objections to such an arrangement in the view of competent health authorities. Many able health officials contend that where the public health authority is responsible for the direction of sickness preventive work, as well as a great variety of special agencies and institutions for the care of the sick, the former, more important duty, is likely to receive less official and public consideration than the latter. The hospitals, dispensaries, and other sickness treatment institutions have a direct appeal to public sympathy and interest, because they have a well defined physical being, render a definite, visible, measurable service to the unfortunate sick or disabled, and call for the expenditure of relatively large amounts of public money. The prevention of sickness is a less tangible community service. The public is never as much concerned about the sickness dangers of the future as it is with sickness at hand. It is likely, therefore, to regard the maintenance and operation of institutions for the treatment of the sick as the chief responsibility of the health authority, and no matter how urgent the need for

sickness preventive work, the health officer may find that the business of directing sickness treatment will call for a disproportionate share of his time and energy. The result often is that prevention of disease comes to be regarded as a minor part of the general health service when it is in fact its very substance. What a community needs to do for the care of its sick will depend largely on what it does to keep people from being sick. If it fails to do the latter, it will have to provide more agencies and institutions for its sick and otherwise dependent.

There is still another argument against the consolidation of preventive and curative health functions under the direction of the health authority. The municipal health officer, who is responsible for the enforcement of laws for the prevention of disease, is, in most cities, a physician. As long as he is required to concern himself exclusively or chiefly with law enforcement and educational activities for sickness prevention, he cannot reasonably be criticized by anyone. On the other hand, if he is required to direct as well the municipal agencies for the treatment of the sick, it is not uncommon for him to become involved in issues which may handicap him in securing the coöperation of the physicians of the community upon whom the success of his preventive work is so largely dependent. When he directs the municipal sickness treatment services, he must necessarily enter a field which many private practitioners regard as peculiarly their own. The writer has never yet found a community in which there was in operation a plan of municipal care of the sick which had the full approval of all practicing physicians. From their point of view, the government either goes too far or not far enough. Either the city provides treatment for many who the private physicians believe should not be cared for at public expense, or it fails to provide for others who are believed to be entitled to such care. Whatever the ground of criticism may be, the health authority, if the hospital is under his direction, is often held responsible for doing the wrong thing or failing to do the right one, and it is at times extremely difficult for him to make an adjustment between the demands of the private practitioners and his own conception of his duty to the public.

The question here commented upon is one which cannot be answered by generalizations. In most small cities, and in some large ones, where municipal services for the care of the sick do not require extensive or highly specialized organization, the municipal health authority may well be given responsibility for their

direction. On the other hand, in those cities where there are large municipal hospitals, dispensaries, sanatoria, and other treatment agencies and institutions, it is probably better not to burden the health authority with their direction. It seems to be the consensus of opinion among health authorities that, as a matter of principle, they should have no responsibility except for those functions which are preventive of sickness. A recent report of a survey of the city of San Francisco referring to the activities of the board of health of that city, which is responsible for the administration of a great variety of special services for the care of the sick and infirm as well as the customary sickness prevention services, puts the matter thus:

> It is, however, not considered a wholly desirable situation which imposes upon the same directing body responsibilty for the highly technical work of providing for the care of the sick poor of the city, and for the domiciliary care of aged and infirm indigents, as well as for the development of the many types of medical and social resources which must be used for the protection and maintenance of health. As the city grows and the burden of these several services becomes unbearable, there will surely be needed a board of trustees for the San Francisco Hospital, with the special divisions for isolation, for tuberculosis, and for leprosy, and its chain of four outlying emergency hospitals, the Relief Home, etc., which will bear the same relation to the superintendents of these institutions as the board of health does to the health officer. Progress in public health work in San Francisco would doubtless have been faster and received more support, if a great part of the time and energy of the health officer and of the board of health had not been so constantly concerned with the operation of the largest plant for the care of sickness in the city, a negative function so far as modern public health work is concerned.[1]

Should Institutions for Sickness Treatment and Other Institutional Services Be Under the Same Direction?

Assuming that the health interests of the community can be best served by a separation as to direction of the preventive and curative health functions, except when the number and extent of the latter is not such as to handicap efficient development of the former,

[1] Haven Emerson and A. C. Phillips, *Hospitals and Health Agencies of San Francisco*, a report made for the Committee on Hospitals and Health Agencies of the Council of Social and Health Agencies, San Francisco, 1923, p. 6.

what should be the plan? Should the hospitals, dispensaries, and other treatment agencies and institutions be directed by an independent agency or agencies or should they be dealt with as special units of a general department of public welfare, department of charities, or other similar agency for coördinating related municipal services for the care of the dependent and otherwise incompetent? The answer to this question is that given good technical direction and management of the medical work of caring for the sick, one plan has no particular advantage over another with respect to the purely professional features of the service. It is, however, in other respects an advantage when the city has a number of institutions for the care of the sick and infirm, the incompetent and delinquent, to have all of these institutions under undivided control. Apart from the strictly technical differences in service needs and aims in the various institutions, the problems of plant operation and maintenance are much the same. Where all municipal institutions for the care of the sick and other purposes are under undivided control, it is possible to obtain better coöperation between institutions and to centralize in the interest of economy and efficiency many of the overhead activities common to all, such as record keeping and accounting, purchasing, storage, and use of supplies, equipment and materials, personnel management, etc.

The relation between the care of the indigent sick and the administration of poor relief is a matter of interest in this connection. Municipal hospitals are designed to provide chiefly for the sick poor who are public charges and cannot otherwise be cared for satisfactorily. That authority of the city government which is responsible for poor relief under the laws of the state must determine what persons are properly eligible for relief at public expense, whether that relief is in the form of medical care, food, fuel, clothing, or what not. It is of some advantage, therefore, from the administrative point of view, to have the hospitals and other institutions and agencies for the care of the sick under the same controlling authority as that responsible for poor relief. If, then, there is in the city government a department of public welfare, charities, or charities and corrections, it would be in accordance with good administrative practice to include institutions for the care of the indigent sick in such a department along with other institutions for the care of the dependent and incompetent. To sum up, experience indicates that it is decidedly better in cities having a large number and variety of hospital and other

special institutional services to centralize administrative control of them, as far as possible, even though the character of the services which they render call for different kinds of technical management. Unquestionably, this type of organization makes for more economic use of public funds.

The Advantages of Centralized Control of All Health and Welfare Functions

Provided the technical management of each major group of health and welfare functions is left to a skilled executive, there are obvious advantages in consolidating all health and welfare functions in a single centrally directed and controlled department of public welfare or department of health and welfare. We have already commented upon the close and intimate relationship which inevitably exists between the prevention and treatment of sickness, the prevention and relief of dependency and the prevention and correction of delinquency. It is the writer's belief that these fundamental relationships must somehow be recognized in municipal government and an organization provided which will guarantee their maintenance. Whether or not this can be done, without the creation of a department of welfare in which each major group of health and welfare functions shall have coördinate place, will depend upon the extent of the coöperation between independent departmental officials and the competency of the head of the city government, mayor or commission as the case may be. If there is a strong mayor or commission at the head of the city government with ample authority to appoint and remove departmental executives and a keen sense of the necessity of departmental harmony and coöperation, it will no doubt be possible to guarantee the development of an integrated health and welfare program without administrative consolidation. But in many instances, the head of the government is obliged to deal with several independent boards and commissions in health and welfare matters, over whose appointment and tenure of office he has not full control. Such boards and commissions may be so established by law that his appointing and removal authority is decidedly limited. Some, perhaps a majority, of board members may have been appointed by the preceding head of the government for terms of office exceeding that of the incumbent mayor or city commission. The greater the number of independent administrative authorities with which the head of the government is obliged to deal, and the more

limited his authority for their appointment and removal, the more difficult it will be for him to develop good coöperation between them. Each board, commission, commissioner, or other department authority has its own aims and ideals and, naturally and sometimes properly, seeks to develop its own service according to its own plan, without, however, always giving due consideration to what may be the needs in other branches of the public service.

There can be no question that such type of administration tends to increased cost. Its existence in many American cities is the cause of much of the criticism which has been made against the high cost of public service. Each independent department must provide for its own purposes certain overhead services which would cost less were such departments reëstablished as merely coördinate bureaus or divisions of a single department. Many of the accounting, record keeping, purchasing, public informational activities, and much of the general clerical and stenographic work required by several independent departments could be centralized with a saving of money and without any loss of efficiency. Much of the equipment needed by each independent department could be used in common under a plan of centralized control. Many of the inspectional and investigational activities carried on by independent departments could be combined in one department with reduction in salary cost and the elimination of duplication of effort. A number of the inspectional and investigational activities carried on by health and welfare agencies, though perhaps not having precisely the same purposes, have the same points of contact with the public. It is not uncommon to find, where such activities are under independent controlling authorities, that several inspectors or investigators will visit the same premises the same day or the same week. Some of this duplication of inspection is perhaps unavoidable; a great deal of it is, however, unnecessary and can be eliminated to advantage by central direction and control.

Briefly summarized, the outstanding advantages which might be expected from the consolidation of all health and welfare functions in a single department with a competent administrative head are these:

1. Instead of depending upon the voluntary coöperation of independent departments, which is difficult to secure in many instances, there would be a definite, purposeful coördination of related public services in a common health and welfare program.

2. Instead of an annual competition between independent

departmental authorities at budget making time, with the likelihood of a poorly balanced program of public expenditures, there would be one departmental budget prepared and presented by the head of the department in which each special group of service functions would have an allotment based upon its own needs, but with due regard for the needs of other coördinate units.

3. Instead of several departments, each carrying on a great variety of activities common to all, there would be one department in which all activities having a common purpose and permitting the common use of personnel and equipment, would be under central control, with resultant saving in the cost of service.

4. Instead of several departments whose technical executive officers must necessarily devote considerable time and attention to routine business matters, often to the enforced neglect of the technical work for which they are especially qualified, there would be one department in which each executive officer would be responsible only for the technical work of his particular unit. All necessary routine business transactions would be carried on in the central office of the department.

The only disadvantage seen by the writer in this type of organization of health and welfare services, is that the special bureau or division charged with the health functions of sickness prevention would not stand out as prominently in the public eye as if these functions were represented by an independent department of health. Because of their necessarily greater financial needs, certain of the other services with which these health functions might be associated in a general department of public welfare, would perhaps draw public attention away from the essential importance of sickness prevention work and the need for its better support by officials and public. In Rochester, New York, for example, the public health service is carried on as a bureau of health of the department of public safety which includes also bureaus of police, fire, and building regulation. Although the public health work of Rochester is most efficiently organized and directed, it is the health officer's opinion that the position of the health bureau in association with bureaus of police and fire has many times been to the disadvantage of the development of his sickness prevention program. Police and fire protection are matters in which citizens are especially interested. They want the best possible protection of this kind and they are prepared to spend public funds without stint in order to obtain it. The natural result is that the needs of

the health bureau in Rochester have at times been subordinated to the needs of its associated bureaus of police and fire. The development of public health service in Rochester, under some administrations of the city government during the past twenty years, has been held at a standstill because the administrative head of the department of public safety was more concerned with the betterment of police and fire protection than with the betterment of health protection. Under a director of public safety, who happened to be especially interested in public health, its subordination to other departmental interests has not, of course, been so evident. Proposals have been made at various times to separate the health bureau from the department of public safety and to establish it either as an independent department or as a bureau of a department of health and charities, but as yet none of these proposals have been adopted by the city government.

There would not be quite the same objection to including the public health service in a department of public welfare with other closely related activities, as is raised against its consolidation with police and fire bureaus in a department of public safety. Police and fire regulation have little or nothing in common with health protection, but health protection, as we have seen, has a most close and intimate relation with public welfare activities generally. In the writer's judgment, however, the objection to the consolidation of all health and welfare activities in appropriate units of a department of public welfare, on the ground that such consolidation may tend to minimize the importance of disease prevention work, is too often overstressed. The advantages of such a consolidation far outweigh any disadvantage on this particular score. A department which includes bureaus of health, police, and fire, such as the department of public safety in Rochester, is not, however, recommended.

Two Problems in Municipal Health Organization and Management

No matter what form of organization of the preventive and curative health functions of government may be found most desirable in a given city, whether they are represented by independent departments, a single department, or are merely bureau or division units of a general department of public welfare, the two functional groups present quite different managerial problems. Prevention of sickness is essentially a "field" service; treatment of sickness is essentially an institutional service.

In the prevention of disease, we are dealing with a great variety of recording, investigational, inspectional, and regulatory activities which require a corps of skilled physicians, nurses, inspectors, clerks, and other observers and recorders. This corps of special agents must be directed in their technical duties by an executive or manager who has a broad general knowledge of community health needs and knows how to organize the efforts of his technical assistants to meet these needs in the field.

The municipal care of the sick is quite a different matter. Here the problem is mainly one of institutional management. Buildings must be provided where the sick may be housed and cared for, special organizations of doctors and nurses must be developed and maintained for the strictly professional work of treatment, and other special organizations must be created for the operation and maintenance of the physical plant or plants. The manager of the hospital, sanatorium, or other institution need not be an expert in sickness prevention, nor even in sickness treatment. He must, however, be one who understands thoroughly how to organize and supervise the work of professional attendants of the sick and of his corps of workers in plant operation and maintenance, so that the two groups will work in harmony for the good of the patient.

In view of the inherent differences between the functions of prevention of sickness and treatment of sickness with respect to their management, we divide our subsequent discussion of them into two parts. Part II, immediately following, is devoted to the organizations and management of sickness preventive functions; Part III, to the organization and management of sickness treatment functions.

PART II

THE ORGANIZATION AND ADMINISTRATION OF SICKNESS PREVENTIVE FUNCTIONS

CHAPTER IV

BOARDS OF HEALTH

In the majority of American cities, as already noted, municipal activities for sickness prevention only, or for both sickness prevention and treatment, are carried on by independent departments of health. Except in those cities where boards generally have been replaced by single officers in order that official responsibility can be more clearly defined, and more direct control of public services maintained by the head of the government, health departments are administered by boards of health. Even when other administrative boards have been abolished, health boards are often continued, either because the state public health law so ordains or because a board of health has so well established itself in the public confidence as to make its elimination difficult if not undesirable.

With respect to the administration of those services of local government which deal particularly and intimately with the lives and social relations of the people, there has always been a strong feeling on the part of public officials and citizens that several heads are better than one. The notion that a board of health is essential to the wise planning and efficient execution of an official community health program is largely grounded in the distrust which citizens have of too great concentration of authority over matters which have such a direct bearing upon their happiness, comfort, and safety. Much the same feeling exists with respect to public education. So it is that the terms "board of health" and "board of education" have a special significance in municipal government; more so, perhaps, in municipal government than in state government, which has a less direct contact with citizens.

The idea that a "meeting of minds" was essential to good health administration had much to support it in the early history of official public health work in this country. Less than a century ago the sources of only a few diseases and the methods of controlling them were known even by the most able physicians. To

determine what ought to be done for the public health, and how to do it, needed, no doubt, at that time, the combined judgment of the best minds of the community, physicians as well as laymen. A board of health was naturally the agency of choice under such circumstances. There were few facts upon which to base a health program, and so it was the sensible thing to rely on the judgment of a select group which was considered capable of forming reliable opinions from such facts as there were. But the situation is quite different to-day. The causes, modes of transmission, and methods of control of most diseases are known, and the "meeting of minds" on public health administration has lost its real significance. The citizen board of health still performs a valuable service in many communities as an interpreter of public opinion on health matters, and as a promoter of citizen coöperation for the support of the health program, but its importance as an administrative agency has certainly been greatly lessened through the substitution of scientific fact for mere opinion as the basis for modern health work.

Among those who have given most thought to health administration, opinion is about equally divided with respect to the merits of boards of health as administrative bodies. Many health authorities hold that the most efficient administration of municipal health services and the best utilization of personnel is impossible under the usual part time, unpaid citizen board of health. Other authorities, just as able, contend that the citizen board of health, because it is not so susceptible to political influence, is the most desirable health administrative authority and should be retained. The writer stands with those who hold that administrative boards of health have outlived their usefulness in the great majority of cities. It is his conviction that higher standards of municipal public health work are more readily attained where the health officer is directly responsible either to the head of the city government or to a single administrative officer of a department of public welfare of which health service is a part.

Certainly the present tendency in municipal government is toward the elimination of boards of health and the direction of health work by single well trained officers. Many health officers, themselves, have been the leaders in the movement toward elimination of boards of health because they have found that the health officer or executive of the board, no matter how great his skill and experience in the management of the health enterprise, is

often seriously handicapped by having his trained judgment overridden by a board less well informed on the subject. On this point, a former deputy commissioner, now commissioner, of health of New York state says:

> It is only in recent years that the importance of the duties of health officers has come to be realized by the public and governing officials. But a comparatively short time ago, the health officer was very apt to be regarded as a sort of necessary evil, sanctioned by the observance of a time honored custom, whose duties largely consisted in posting placards on quarantined premises, and making more or less successful attempts to stop the spread of infectious diseases before they became epidemic. By many people he was thought to be more of a nuisance than those which he was called upon to suppress. His salary was usually the minimum permitted by law; and grudgingly provided for in the municipal budget.
>
> The actual position of the health officer to-day, while not materially better than formerly, gives promise of a brighter future, largely by reason of the greatly increased value which public opinion has learned to place upon the duties of his office; such value in any city being directly proportionate to the efficiency and tact with which the local officer performs his work.
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> By abolishing boards of health and intermediary officials and making the health commissioner or health officer the head of a department responsible for the proper performance of his duty only to the public and the mayor or other municipal chief or body, the health officer is immediately thrown into the limelight, must assume full responsibility for his acts, and can neither take refuge behind nor be hampered by a board or other municipal officer, both of which occurrences have been by no means unfrequent. The value of a medical board or commissioner of public safety to a health officer may at times be apparent; but there have been sufficient examples throughout the state of noncoöperation, indifference, or actual hostility to warrant the discontinuance of their authority over matters pertaining to public health, especially since the law provides for an advisory board of physicians to whom the health officer or commissioner may look for guidance and counsel when he so desires.[1]

In view of the fact that boards of health have such a well established position in municipal health practice, it is, however, necessary to inquire somewhat into their character and composition and to

[1] Matthias Nicoll, "Some Factors in Municipal Health Administration," *Health News* (Monthly Bulletin of the New York State Department of Health), April, 1922.

consider the arguments commonly made for their retention in the official machinery of government.

The General Characteristics of Boards of Health

There is little uniformity with respect to the qualifications of the appointed members of a board of health other than that, in the great majority of cities, one or more, occasionally all, members must be physicians. In some cases, in order to be eligible for appointment, a physician must have been in practice for a stated period; in others the length of time which he has spent in practice has no weight. Citizenship and residence in the community are usually insisted upon, but these are not always required by law. In a few cities, it is required that women be represented on the board, or that it include members of certain professions or trades, as a plumber, a lawyer, an engineer, etc.

Appointments to the board of health are ordinarily made by the head of the city government, with or without the approval of the city council. In a few instances appointments of physician members are made from a list of eligibles furnished by a local medical society. Boards of health may be made up entirely of appointive members, part appointive and part ex officio, or wholly ex officio. Ex officio boards may include the mayor or the city commission, if the city is commission governed; frequently, other officers of government are also included, as the director of safety or police commissioner, director of charities or welfare, city attorney, and city engineer. In many cities under commission government, their charters provide that the elective city commission may act as a board of health if it chooses to do so. The number of members of an appointive board of health may range from three to fifteen. In most cities, however, the board has from three to seven members, usually an odd number.

The tenure of office of appointive members of boards of health also varies considerably. In some cities all appointive members of the board of health are appointed by the elective head of the government with tenure coterminous with his own. In other cities appointments are made for overlapping terms of six years or more, the retirement of one or two members coming every year or two years. In such cases, there cannot be a complete change in the membership of the board during one term of office of the head of the government who is usually elected for a term of two or four years. The theory is that this plan prevents a complete and

radical overturn of a board by an incumbent mayor or commission and thereby hampers partisan political interference.

The president of the board of health, usually a physician, may have that title conferred upon him at his appointment, or the board may be privileged to elect its own presiding officer. The board may select a secretary to act as its executive officer, who may be a member of the board and receive additional compensation for his services as secretary, or the board may appoint as secretary a physician or laymen not a member of the board. The usual procedure, however, is for the board to appoint a physician health officer, not a member of the board, and to designate him secretary.

In most instances, local boards of health are required by law to meet at least once a month in regular session and at such other times as the president may elect. The members do not as a rule receive any compensation for their services. In a few cities, board members are allowed a fixed sum for each meeting attended, with the stipulation that the total payments in any one year shall not exceed a given sum.

Boards of health are less frequently found in commission and manager cities than in those under the mayor-council form of government. In the commission governed cities, the city commission is often given authority to act as a board of health. Since such commission is a board of three or five members, it can perform satisfactorily all health functions for which boards are supposed to have peculiar aptitude. In many of these cities, therefore, the city commissions have abolished citizen boards of health, and act as boards of health on their own responsibility. In manager cities where the aim is to centralize management of public affairs the tendency has been to eliminate boards of health and to fix responsibility for health service upon a single skilled executive. Where consolidation of health and welfare activities has been carried out, as in a department of public welfare, the health service becomes merely one unit of such department under the administrative direction and control of the head of that department. Since the health service loses its complete independence when so administered, the administrative board of health must necessarily be abolished and its authority and responsibility vested in the head of the public welfare department, whether that head be a board or an individual.

Where the board of health has been abolished and administrative responsibility put upon a single officer, it has sometimes been

found desirable to create some form of advisory board or council which will aid that officer in framing his regulations and health ordinances, and in developing public support for them. Such an advisory board or council brings to the consideration of these matters that deliberative, many-sided public view of health action which is regarded as one of the desirable features of citizen boards.

The Board of Health as an Executive

The function of a board of health is essentially executive, and therein lies its chief weakness. A board of health is most always made up of citizens who are regarded by the public as worthy to represent it. Such persons in every community are men and women of affairs who have their own private interests to conserve. They cannot often give to public service the time and attention that it needs, and whether the board employs an executive officer or not it cannot dismiss its own executive obligations.

It is difficult for the board to exercise its executive function efficiently because to act legally it must act as a unit. That which may be done, or ordered done, by a single member of the board on his own initiative, without a prior formal endorsement of the action by the board as a body, may be illegal. Yet there are times when the necessity of such formal action by the board is decidedly a handicap to community health protection. On this point there are many court decisions that might be cited. Dr. Henry B. Hemenway, an authority on public health law, formerly chief at the division of public health instruction of the Illinois State health department, says with reference to the board of health as an executive:

> One of the strong legal objections to a board of health is that it has no real legislative authority and as an executive it is weak because it requires the combined decision of the entire board. . . . The law of the state of Iowa granted to local boards of health the authority to establish quarantine. A case of serious communicable disease was discovered and immediately reported. The clerk of the board called up, by telephone, each member of that board, getting their consent to establish quarantine. There was no formal action, and therefore the supreme court held that the quarantine was not a legal quarantine. It was not the action of the board; it was the coöperative action of the individuals.[2]

[2] H. B. Hemenway, "Sanitary Codes and Laws," a lecture delivered in a course on public health administration conducted by the New York Bureau of Municipal Research and the New York Academy of Medicine, 1919.

The efficiency of executive action is largely dependent upon the promptness with which it is taken. Emergencies are constantly arising in public health service, which if met adequately, must be met immediately. It is well nigh impossible for a board of health to forsee all of these emergency situations or always to be promptly available to take formal action when emergencies arise. Even when the board as the executive has delegated managerial duties to a paid health officer, the limitations of the authority of the latter are frequently a handicap to good health control. In the writer's personal experience the incompetency of the board of health as an executive has been observed many times. The following illustration is not an isolated one. The lay health officer of a city of about 100,000 population, having been informed that a homeless person had been observed in the city who showed evidence of an eruption thought to be smallpox, sought authority to quarantine the suspected person. As the information received had not come through a physician, and neither the regulations of the health board nor the state laws seemed to give the requisite authority for quarantine under the circumstances, the health officer appealed to his board to take some formal action immediately. It was impossible for the board to do so on that day or the next owing to the fact that several members of the board were absent from the city. The board finally met two days later, decided that it had the authority to detain the suspected person and issued an order for his apprehension and isolation. The man was finally isolated and developed a severe case of smallpox. Subsequently, several cases of smallpox appeared among unvaccinated persons with whom the patient had associated prior to his isolation. Had full responsibility been vested in a thoroughly competent health officer as the head of the health department without the intervention of a board, this community might have been saved a very serious outbreak of smallpox. Such a situation as has been described would possibly not have occurred had the state health laws been sufficiently explicit as to the powers and duties of local authorities, if the health officer had been more energetic, or if the board had been more keenly alive to its responsibilities. But state laws must by the very nature of things be general in their application; and it is, perhaps, too much to expect that any part time citizen board of health can always be available when its action is needed. Whatever may be said of the merits of boards of health in their other capacities, they are rarely qualified to meet their executive responsibilities.

Politics and Boards of Health

The argument most frequently heard against "one man control" of health matters is that a board of reputable citizens is in one way or another more competent to "take the health department out of politics." Citizens feel, and justly so, that of all branches of the government the health department should have the most complete immunity from partisan political influences. It is the writer's opinion, however, that board administration of any public department offers far greater opportunity for political manipulation than any other administrative plan. Every member of a board represents, whether he is aware of it or not, an avenue of political approach for the self-interested politician. The more persons responsible for administration, the greater the opportunity for political influence and political log rolling. It is significant that the most violent opposition to strong centralization of government has come from partisan politicians, not because they fear that the public will be deprived of adequate representation in government, but probably because they fear the loss of patronage and the loss of political influence. It is also significant that in many of the laws establishing boards of health one finds it specifically stated that the board of health shall not give representation to one political party only. This means, if it means anything, that partisan politics in board matters is expected and effort is made to mitigate its evils by giving all political parties a hand in affairs.

"Taking the health department out of politics" is after all little more than a slogan and like most slogans it does not mean quite what it says. There is no administrative device which will take any public department in a democracy out of politics. What the slogan really means, is that health departments should be as far removed from partisan political influence as possible, and as we have pointed out, board administration of health matters seems a poor device for this purpose. It is the experience of many of those who have had greatest opportunity to study municipal health administration in this country that the most effective way of eliminating partisan politics from public health service is to put responsibility for its administration upon a single competent individual appointed by the elective head of the government, guarantee this individual a reasonable tenure of office, and then hold him to strict accountability for results. If partisan politics then intervenes in health affairs to the public's detriment, it will be clear enough where

responsibility lies. If, on the other hand, the head of the health service is a board over which the elective head of the city government has not complete authority of appointment and removal, and is composed of citizens whose interests are partly public and partly private, the responsibility for playing partisan politics is sometimes as difficult to locate as the proverbial needle in the haystack.

"Continuity of Policy" in Board Administration

It is often argued that a board of health, so appointed that the elective head of the government has the appointment only of a minority of the board during his incumbency is thereby safeguarded against serious interference at each change in the political control of government and can, in consequence, maintain "continuity of policy." Such a method of appointing a board does, indeed, confer some immunity against any radical overturn of health policy, but it is obvious that the elective head of the government cannot fairly be held responsible by the electorate for the action of a board over which his control is so restricted. Since the head of the government must depend for his control of health policy upon his power to appoint and remove those who are to carry out that policy, limitation of his power of appointment and removal of board members may sometimes seriously interfere with effective administration.

A board of health so constituted that the head of the government is in control only of a minority in that board, may be an efficient board or it may not be. "Continuity of policy" is a phrase often used in its application to board administration as implying that such continuity is always desirable and always means progress. But this is not the fact; there is ample evidence that continuity of policy in health board matters means inertia fully as often as progress. The most progressive municipal health services, in the experience of the writer at least, have been those in which continuity of policy has been determined not by a part-time citizen board which is relatively independent of the elective head of the government, but by a single officer who had no other business except public business and owed no allegiance to any authority except the head of the government and the public. It is true that, under such circumstances, a good health director might be removed from office by the head of the government for purely political or personal reasons, but it is also true that a bad health officer could be removed if necessary. The fact is that health officers who have

demonstrated their efficiency and who have in consequence good public support are rarely removed by the head of the government, even when he has full authority to do so, because he knows that he must accept full responsibility for his act.

Boards of Health and Their Quasi Legislative Functions

Another argument frequently heard in favor of board administration of health activities, is that a board is capable of exercising certain functions of a quasi legislative nature not to be satisfactorily performed by a single individual. The reference is to those powers commonly granted local boards of health by state laws to enact rules and regulations having the effect of law in interpretation of the basic public health statutes and general ordinances of the city. By virtue of this authority boards of health can, and do, enact local regulations without being under the necessity in all cases of putting the regulations before the local municipal legislative body for its action. This is, of course, of material advantage in expediting law enforcement. It should be clearly understood, however, that boards of health have, strictly speaking, no legislative function. They cannot legally issue any orders or enact any regulations not authorized by the laws of the state, nor can they enact any regulations contrary to general city ordinances. The rules and regulations enacted by a board of health are not the law, as many court decisions have demonstrated, although the courts are inclined to construe health regulations liberally.[3]

It is conceded that a board of health is well adapted to the business of framing and promulgating sanitary rules and regulations. But such powers are not vested by state laws essentially in boards of health but in the health authority, whether that authority be a board or single officer. If the public health law of the state is sufficiently explicit regarding the action of such authority, no difficulty is likely to arise. In regulatory matters not fully covered by the state law, the health authority may resort to its local legislative body for the enactment of municipal ordinances covering the situation. To this end there should be in every municipal council a special committee on public health with which the head of the health department or bureau may coöperate for the initiation and enactment of local health ordinances.

[3] J. A. Tobey, *Public Health Law*, 1926, pp. 72-74.

A Summary of Criticism and Suggestion on Health Board Administration

It should not be understood by the reader that the weaknesses of boards of health, which have been pointed out, call for the abandonment of such boards in all communities and the adoption of the "one man control" plan, even where this might readily be done. There are many small communities where the part-time citizen board of health is necessary because of the inability of the community to pay the cost of maintaining health service under a single adequately paid official. There are also many communities where health service is being efficiently developed by boards of health of unusual competency and their elimination would be inexpedient. For the great majority of communities it is believed, however, that the abolition of administrative boards of health and their replacement by single adequately paid, full time officers is warranted.

The defects of board administration which seem to be common to the great majority of boards and most deterrent to the betterment of standards of public health service, may be restated thus.

1. A board of health is, in its very nature, incompetent as an executive. Promptness and directness of action is impeded because such action, in order to be legal, must be formally taken by the board as a whole.

2. Since efficient board action is dependent upon its employment of a competent executive officer and its reliance upon such officer in management, the board's function must necessarily become mainly advisory. If so, it loses its own executive importance and therefore performs no essential executive function which could not be better performed by a single officer without the intervention of a board.

3. The board of health composed of citizens engaged in private enterprises is not competent always to take an unbiased view of public health matters. The most efficient administration of public health service requires that the administrator shall have no business except the public business.

4. Board administration more often than not tends to foster partisan political interference with health matters, because it increases the number of avenues of political approach and makes it more difficult for the public to eliminate political interference when it does occur.

It is apparent from the review of the composition, functions, merits, and defects of boards of health that there are about as many different kinds of boards as there are communities concerned. Apparently the qualifications, numbers of members, method of appointment, or tenure of office have no particular reference to the nature of administrative health problems. There is further nothing in the character or composition of local boards of health which can be singled out as differentiating good boards from poor ones, or which is uniformly characteristic of either efficient or inefficient boards. One might expect that after a century or so of experience with health boards, some rather definite standards would have been set up with respect to them. As far as the writer is aware, however, relatively little thought has been given to the formulation of such standards even by those who believe most firmly in the theory of public health administration which boards of health exemplify.

Assuming for the moment that a board of health is necessary to good administration of municipal health work, it may, therefore, be well to attempt a definition of the standards which, in the writer's experience, at least, seem best adapted to administrative purposes. These are briefly:

1. The board of health should consist of not more than seven members. This is about as large a group as can function efficiently as an executive body, even under the most favorable conditions.

2. The members of the board of health should be appointed mainly, if not wholly, from among private citizens of recognized standing and integrity in the community. The inclusion in a board of health of representatives of other city departments as ex officio members, tends to narrow the viewpoint of the board and to introduce political issues which are likely to cause discord.

3. While the board should include one or more representatives of the medical profession, it is not good policy to permit the domination of the board by a physician majority. The professional interests of private medical practitioners do not always coincide with the interests of the general public.

4. The tenure of office of board members should be long enough to permit a board to familiarize itself with the subject, and to initiate and carry out a constructive health program, and yet not so long that it may result in petrifying health policy. By this we mean that there is a natural tendency of boards with long tenure to become so satisfied with time honored policy and pro-

cedure that new ideas are ignored. Tenure of a year or two years is too short; tenure of more than six years is too long. Four years would seem a reasonable mean adapted to conditions in most cities.

5. Appointments to a board of health should be so made that there will not be a complete overturn of the board at each election of a new head of the city government. Some plan of rotation should be adopted which will provide for the retirement of one or two members, perhaps, each year, so that there will always be a nucleus of experienced members to familiarize new appointees with their work. Preferably, in order to give the head of the city government the responsibility for public service which he ought to have, the tenure of board members should be such that the head should have the power to appoint a majority of the board during his incumbency.

6. The board of health, which is primarily executive in function, should delegate executive management to a trained officer in order that there may be the least possible delay in carrying out its mandates. The members of the board should interfere as little as possible in the details of management in order that the disciplinary control of personnel by the executive officer may not be impaired.

CHAPTER V

THE HEALTH OFFICER, HIS DUTIES AND SALARY

Whether or not there is a board of health at the head of the health service, the success of sickness prevention work will depend upon its direction by an executive officer who is thoroughly qualified as an expert in sanitary science and public health practice. The application of modern standards of disease prevention requires that the health officer shall be fully qualified by education, experience and personal aptitude for this very important work. The health officer's position is no longer regarded as a political job to be performed satisfactorily by the average local physician as a "side line" of his private practice, or by any well intentioned but untrained layman. To-day, training for public health management is recognized as a special course leading to the degree of doctor of public health in many of the larger universities and, in the best of these schools, the prospective health officer must have had previous professional training either in medicine or sanitary science. The demand for health officers so trained is growing rapidly, and the evidence of it is to be found in the enactment of state laws and municipal charters and ordinances which specify that the health officer shall be a doctor of public health or shall have qualifications of experience and training which may be accepted as the equivalent of such degree. There are, of course, many excellent health officers now in active service who have gained skill only in the school of practical experience; and there will be many in the future who are not doctors of public health. It seems certain, however, that in the near future professionally trained persons only will be chosen as city health officers.

In a few cities sanitary engineers have been appointed as health officers and some of them have made creditable records. In the majority of cities, however, physicians are chosen as health officers for obvious reasons. The health officer must depend in large measure for the success of his work upon the coöperation of the physicians of the community. The latter are much more likely

to support the health officer if he is a physician, and the public is more likely to respect his opinions on health matters if it knows that he understands, as a physician, the nature of disease and its causes. Not all doctors are good health teachers, it is true, but the physician who has been well trained should be better fitted to teach health than one trained in any other profession; and teaching health is a most important part of the health officer's work.

The Part Time Health Officer

Although whole time health officer service is the ideal, there are many small communities, chiefly those under 10,000 population, where the whole time health officer is unnecessary or inadvisable. In such communities, it is the practice to employ a local physician as a part time health officer. But part time health officers are still to be found in many cities ranging from 10,000 to as high as 250,000 population, although in the majority of these communities whole time health officers are needed. In a recent survey of 86 cities in the 40,000 to 70,000 population group, it was found that 41 of the 86 health officers were part time officials.[1] In another survey of 83 cities of 100,000 population and over, it was found that 30 health officers were giving part time only to their official duties.[2]

The chief difficulty with the part time health officer plan is that such person is in most cases a local physician, and this compels a mingling of incompatible elements, the result of which is quite likely to be inefficient health management. The private practitioner who also acts as health officer is many times called upon to take official action which is likely to be injurious to his private professional interests. He must, if he is an efficient health officer, enforce health laws and regulations which may result in the loss of his private patients. Furthermore, he is likely to find that if he gives the attention to public service which is needed, he is compelled to neglect his private practice, and on the completion of his public career he is in the position of having to build up his private practice anew. The net result is that it is extremely difficult to induce the most competent physicians of the community

[1] Research Division of the American Child Health Association, *A Health Survey of 86 Cities,* New York, American Health Association, 1925.

[2] American Public Health Association (coöperating with the United States Public Health Service, *Report of the Committee on Municipal Health Department Practice,* Public Health Bulletin, No. 136, July, 1923.

to accept appointments as health officers, and such appointments not infrequently go to physicians who aspire to political influence or who "need the job" because they are not successful in private practice. It would be unfair to many part time physician health officers to say that they are either incompetent practitioners or inefficient health officers. It is certainly true, however, that standards of health work and the individual efficiency of health officers are generally much higher where complete separation of public health management and the private practice of medicine is insisted upon. It is certain also that in most cities of 25,000 population, or more, the demands of modern health administration are such as to require the health officer to devote his entire time to his official duties.

In order to meet the need of many small communities where it would be impracticable to provide a whole time health officer, the consolidation of several such communities in a single health district under a whole time health officer has been found practicable in a number of states. The county seems the most satisfactory unit for health administration of small local units and in certain states, notably, North Carolina, South Carolina, Mexico, Alabama, Ohio, and Georgia, part time physician health management of local services has been largely replaced by county health organizations, with full time health officers in charge.[3] There can be no doubt that the elimination thereby of part time physician health officers has been productive of much higher standards of work in rural and semirural places.

The Nature of the Health Officer's Duties

The duties of the health officer will vary somewhat depending upon the organization of health work and its relation to other services of government. We may, however, define his duties, generally, as of two chief types: (1) the direction of those overhead activities which are common to all branches of public service, as personnel management, purchasing, budget preparation, accounting, record keeping, reporting, etc., and (2) the direction of those special technical activities which are peculiar to health service, as vital statistics registration and research, prevention of communicable disease, child hygiene, food inspection, sanitary inspection, and health education.

[3] L. L. Lumsden, *Extent of Rural Health Service in the United States*, 1920-1924, Reprint No. 921 from Public Health Reports, May 16, 1924.

If the health officer is merely an executive officer of a board, his responsibilities with respect to these two types of duty may be, and probably will be, limited to the extent that the board takes upon itself managerial duties, as it often does. On the other hand, if the health officer is the sole head of a department of health and has no board intervening between himself and the head of the city government, he will have to be directly responsible for all of these varied duties, under such limitations as may be of general application to all departments of government. His duties with respect to personnel management may, for example, be determined somewhat by civil service regulations, if there is civil service. If there is centralized purchasing for the city, his duties as a purchasing agent will be subject to the general purchasing plan. If there is a properly organized central accounting system for the city government, accounting procedure within his department will likely be governed by the general plan of accounting control.

Under the plan previously discussed for consolidating all health and welfare services in a single department of welfare, the duties of the health officer would be limited mainly, perhaps wholly, to the actual direction of technical activities of sickness prevention. That is to say, the health officer as head of a bureau of health of a department of public welfare, would not be responsible generally for the overhead activities above mentioned. The head of the department of public welfare might consolidate these overhead activities for all units of the department under his own direction, or he might choose to delegate certain of them to his bureau or division chiefs. All purchasing, if departmental purchasing is the practice, would probably be done by the head of the department of welfare or by a special staff officer under his personal direction. The selection, discipline and training of health personnel might also be under the immediate direction of the head of such department unless the authority of the department head in this respect were limited by civil service or other comparable agency. The head of the department would probably prepare and present the consolidated budget for the entire department including the health unit or units and he would be likely to take over under his personal supervision such other overhead duties as might be maintained in common for all units.

Saving the Health Officer's Time Through Good Organization

The latter plan of organization has much to commend it since

it permits the health officer to devote his effort to those activities which have a direct bearing on community health betterment. The health officer who is obliged to spend a large share of his time in dealing with matters of accounting and finance, purchasing, record keeping, etc., is not being used to best advantage. Under such circumstances the community does not get all that it ought from its health officer. If through better organization of city government generally, and the health and welfare activities of government particularly, the health officer can be relieved of responsibility for these purely routine matters for which he is not ordinarily qualified by training, experience or inclination, it will be possible for him to devote his time in a really productive way, to law enforcement, scientific research, public education and community leadership for health.

On this point it may be well to elaborate somewhat. In the greater number of cities where health work is represented by an independent department, one finds much of the time of the health officer and his assistants devoted to the maintenance of accounting procedure and records. Now if the general accounting system of the city government is properly organized, the accounting work necessary in the health department or bureau can be reduced to the minimum. All that the health executive needs to know is how much money he has to spend for his various activities and what his expenditures have been for any given period. If the general accounting department of the city government is functioning as it ought, it should be able to furnish him at any time a complete statement of the budget balance available for health purposes, together with the details of expenditure to date classified in any way that he may desire. He may need to keep for his own information special records of unit cost, such as cost per inspection, cost per mile for auto service, cost per patient day in the isolation hospital, etc., but given a properly detailed statement of expenditures from the city comptroller's office, these cost figures are readily derived, provided the health officer keeps proper records of work done. We shall consider this subject in greater detail later.

When the health officer is required to do the purchasing for his department or bureau, it will be necessary for him to follow the procedure of purchasing agents generally. In such case the health officer should prepare specifications for the articles to be purchased; keep an index of prices current for the various articles, and an

index also of responsible dealers; prepare forms of contract for goods to be so purchased; call for bids from responsible dealers, and authorize the contracts. On the delivery of goods purchased, their inspection should be provided by the health officer to see that they conform to specifications. Even though he may delegate responsibility to a subordinate he cannot well avoid devoting considerable time to the supervision of the work. If, on the other hand, the purchasing function is performed for his department or bureau by a purchasing agent representing the city government as a whole or a group of related agencies, the health officer's duty will be limited to the issuance of requisitions, and the approval of supplies purchased and delivered to him in return. This latter procedure would mean for many health officers a considerable saving of time and energy which could be devoted to more productive work.

In a few cities it has been found of advantage in economizing the time of the health executive to centralize the reception and preliminary review of citizen complaints in one general department or bureau of government. Complaints which are found by such central office to come properly within the field of public health are referred to the health executive for action. The reason for the adoption of this complaint procedure is that the health office is otherwise called upon to receive and review complaints of all sorts, many of which have not the remotest bearing upon community health and in consequence have to be redirected to other departments. The health officer has from time immemorial been regarded by citizens as a person whose chief business it is to correct nuisances and annoyances of all kinds—and unless it is made possible for him to direct his attention only to those which are of health significance much of his energy is likely to be wasted.

We have already suggested in a previous chapter that the health authority should not ordinarily be charged with the direction of services for the care of the sick, except possibly the hospital for the isolation of patients with communicable diseases. If he is charged with such duty, he should not be required to give his personal attention to their technical management. It is not uncommon, where the health officer is personally held responsible for the management of hospitals and other institutions for the sick, that in order to give them the supervision they need, he is compelled to neglect many other activities of greater importance in the prevention of sickness which is his chief obligation. So the

health officer should not be called upon to act as a hospital superintendent or as a hospital attending physician. He should have for such service the necessary superintendents or resident medical officers to whom he may delegate the duties of management. Hospital management is a special field requiring a different type of experience and training than the health officer commonly has and requiring also more personal attention than the health officer alone can properly give to it.

The health officer in the large city must depend mainly upon his subordinates in their special fields to furnish him with facts regarding the conditions requiring the exercise of his special authority. If his various activities are properly organized, his subordinates thoroughly trained and instructed, and their procedure well ordered, the information needed by him on conditions in the field can be made available to him daily as a matter of routine. He will then be able to devote himself more profitably to the development of community coöperation and support for his program. If, on the contrary, he must waste his time and energy doing things which under better organization could and should be done by subordinates, he is either a poor manager or his budget represents a faulty appreciation of values on the part of the community. The health officer must have time to think, to look ahead and plan, to teach health, and to develop in his community the support which he needs. He must be prepared to demonstrate his capacity for health leadership in the community. If he is tied to the routine of an office desk, or required to give his time to activities which are unproductive in sickness prevention, either because his funds are not sufficient to permit him to employ competent aids, or because he is not using himself and his staff to best advantage, he will have little opportunity to develop community interest in health and community support for his work.

The Health Officer and Law Enforcement

The health officer has quite broad discretion in the enforcement of health laws, rules and regulations. The courts are inclined to uphold a health officer in the exercise of his discretionary powers, even though he may in emergency go somewhat beyond the precise limits of the law, provided he is able to demonstrate that he has acted in good faith and in the interest of the public health. If he does go beyond the legal limit of his powers he is, however, liable as an individual and the injured person or corporation may resort

to civil action against him. So the health officer in the enforcement of law, or his interpretation of it, must be careful always to lay a proper basis for his action. He must not neglect to secure all the facts as far as they are essential in determining the legality of the act.

Although the health officer is in duty bound to enforce public health laws, mere law enforcement cannot be relied upon for community health protection. The health laws must of necessity be general in their application, and there will be occasions when strict enforcement of the law is impracticable if not impossible. To enforce all public health laws and regulations to the letter might require in many cities an expenditure of time and money for inspectors and other agents which would not produce an equivalent return in health protection. Many health laws and regulations are still found in effect which are inconsistent with present knowledge of sanitary science. Many others, though of clearly proven necessity, can only be enforced adequately by the development of a spirit of obedience to health laws on the part of citizens. The sanitary policeman is a necessary agent for health protection, but the wise health officer usually relies less upon the exercise of his mandatory police powers than upon health education and health persuasion. However, when he must resort to strict law enforcement there should be no hesitation or delay, for the effectiveness of his action will depend largely upon the promptness with which it is taken.

A good illustration of the situation confronting the health officer in law enforcement is found in the control of communicable diseases. The public health laws invariably require that physicians and others having knowledge of the existence of such diseases shall report the facts to the health authority within a stated time, usually twenty-four to forty-eight hours after observation. Now this is a necessary law because otherwise such diseases might spread rapidly even to epidemic proportions. It is essential that the health officer enforce this law, but it must be done with discretion. If it were rigidly enforced in every community, there would be few physicians who would escape penalty, and yet their technical violation of the law is due more often to excusable inadvertence than to positive neglect or evasion of the law. The health officer must depend for his success in disease prevention upon the coöperation of private physicians and he must be tolerant, within reasonable limits, of occasional technical violations of disease notification laws. He

must, however, be prompt to take legal action against physicians who persistently or intentionally offend in this respect after due notice has been given them of their delinquency. A single prosecution in such case has a salutary effect; wholesale prosecution might serve only to antagonize many physicians who would otherwise give the fullest measure of coöperation.

Health Officers' Salaries

From the surveys of municipal health administration to which previous reference has been made the facts regarding health officers' salaries may be briefly summarized as follows: In the 83 cities over 100,000 population and over, 53 health officers were whole time and 30 part time officials. The salaries of the whole time officers ranged in these cities from $2,000 to $10,000 a year, and those of part time officers from slightly less than $2,000 to between $5,000 and $6,000. The average salaries were $4,840 for the former group and $3,104 for the latter. In the 86 cities from 40,000 to 70,000 population, there were 45 whole time health officers and 41 part time officers. The salary range of whole time officers was from $1,000 to $5,000 and over, and for part time officers from $1,000 to $5,000 maximum. The average salaries were $3,404 for the former group and $2,459 for the latter.

It would appear from these figures that the amount of time required of the health officer is not a determining factor in fixing his salary. It would also appear that population alone does not determine what his salary should be. Obviously, the general and special qualifications and fitness of the health officer, the salary standards prevailing in the public service of the given community, and the general public's appreciation of health problems and health needs must be taken into account. But whatever conclusions may be drawn from analysis of the facts about the salaries of health officers as reported in these surveys, and whatever may be the special local factors influencing salary rates in public service, the salary of the health officer should be based primarily on the following factors:

1. *The size of the community.* There are many other factors besides the mere number of people to be considered in determining health needs and the nature and extent of the health organization required, but in American cities, populations of comparable size require much the same character of health protection and much the same type of health organization. The larger the population,

the greater the responsibility of the health officer; the greater the health officer's responsibility, the more he should be paid.

2. *The requirement of full time or part time service by the health officer.* This is in a measure dependent upon the size of the community. If it is large enough to need a health officer on full time, the salary offered should be sufficient to make it possible for him to live on it according to standards suited to his official and professional status in the community. The underpaid, whole time health officer, dependent only upon his salary, who has to struggle to maintain his own self-respect and his respect for public service, is badly handicapped in his effort to secure the respect of his community. If the health officer is a part time official his salary should be a reasonable payment for professional service, but the amount of time which he is required to devote to his official duties should be defined as far as possible so that a reasonable payment can be fairly gauged.

3. *The educational and experience qualifications of the health officer.* The health officer, part time or whole time, who has qualified himself professionally for public health work, perhaps at considerable expense, or who has attained competence in such work by long experience, is clearly entitled to higher salary than one who has not so qualified himself. It is a fair assumption for purposes of salary payment, that the former is worth more to the community than the latter.

Considering only the whole time health officers, $2,500 represents a reasonable minimum salary sufficient, however, only for a young man at the beginning of his career as health officer. In cities from 25,000 to 100,000 population, a salary range from $3,000 to $5,000 would meet ordinary requirements. In cities from 100,000 to 500,000 population from $5,000 to $7,500, or more, might well be offered, and for cities above 500,000 population $10,000, or more, would not be too much to pay for the right man. As we have said, there are many purely local factors which would need to be considered in making the right salary adjustment, but the responsibilities of the health officer and the high professional qualifications which his work demands should entitle him to rank as to salary with the highest paid officials of comparable station in the public service.

The salary of the part time official is, as noted, similarly based upon his professional qualifications, the extent of the demand upon his time and the nature of his responsibilities. It should be remem-

bered, however, that the part time official has, in the majority of instances, other sources of income which are not available to the whole time officer. In small communities, say under 10,000 population, where part time service is all that is needed, $2,000 may be regarded as a reasonable maximum. In larger cities, from 10,000 to 50,000 population, where part time service may meet the need, and there are comparatively few such cities, a maximum of perhaps $3,000 could be justified. In the writer's judgment, however, a salary of $3,000 for part time health officer service in a city of over 25,000 population would be an extravagance, except for an unusually well qualified and expert person. In cities of over 50,000 population part time health officers cannot, under ordinary circumstances, give the community the kind of service it needs, regardless of the salary paid.

CHAPTER VI

HEALTH EMPLOYEES, THEIR SELECTION, MANAGEMENT AND TRAINING

Public health service has been seriously handicapped in many cities because public officials have regarded health work as a routine performance, not requiring high mental or physical competency on the part of employees. So it happens that, not infrequently, health department appointments have been used to furnish "jobs" for faithful political henchmen and as a means of "taking care of" superannuated policemen, firemen, and other public servants who are no longer fit for active duty in these employments. This conception of the kind of personal service required in public health work is clearly not conducive to good selection of employees. Nowhere in public service is there more insistent demand for skilled, intelligent, physically competent workers, with personal aptitude for the business of teaching health. As we have said, modern health work is much more than law enforcement; it is public education, and for this service more educators are needed rather than more policemen.

Whatever the type of health organization and whatever the responsibilities of the health officer, there should be as little limitation as possible of his authority to select the kind of employees he wants and needs. If he is a well trained, experienced health officer he will know whom he wants, and, if he is given authority to select his workers, he will not be inclined to jeopardize his program by choosing inefficient workers. If he is not a competent executive, the use which he makes of his authority in this respect will readily determine his own incompetency and point the way to his removal. It is far better to put responsibility for the selection of his subordinates squarely upon a health officer and hold him to it, than so to limit his authority in this respect that he is incapable of preventing bad selection of employees, and in consequence cannot be held to answer for their failure to make good.

It is, however, rare that a health executive is not subject to some restriction of his appointing power. If there is civil service, his authority to select his employees will probably be limited by certain general regulations applicable to all public service. If there is a board of health, with or without civil service, the board will, in the majority of instances, have something to say about appointments. If the health executive is at the head of a bureau of health of a department of public welfare, the head of such department will have final responsibility for appointments, which he may or may not exercise. Even where the health officer is in supreme control of a department of health and responsible directly to the head of the city government, he may be obliged to obtain approval of his appointments by the latter or, in some cases, by the city council. It is reasonable to hold the health executive to the same procedure as may apply to all branches of public service, as under civil service regulations or other general rules, but any other interference with his power of free choice of personnel, except as it may be limited by the health budget, should be avoided. Divided responsibility for the selection of personnel invariably leads to political interference with appointments and hampers the executive's efficient use of his organization.

What we have said with reference to the appointment of employees applies as well to their removal, except that the employee once appointed has certain rights which the health executive or other appointing power is bound to respect. But in the effort to safeguard the rights of employees, the public is many times done an injustice. No matter what scheme may be devised for preventing the selection of incompetents, incompetency and worse cannot be guarded against unless removal of employees can be promptly and easily made. Once the health executive has obtained evidence which convinces him that an employee ought to be removed, the fewest possible barriers should be placed in the way of his action to this end. Since the health executive or other officer who removes an employee is likely to have to sustain his charges in court, it follows that he should maintain such records of the service and conduct of his employees as will determine their right to remain on the payroll.

Illustrations of the difficulties which health officers encounter when their disciplinary control of employees is so hampered by limitation of their appointing and removal authority can be found in almost every city. Two will perhaps suffice.

One of the chief reasons for inefficiency of health administration in Stamford at the present time is the lack of control which the health officer has of his subordinates. In theory, they are all responsible to him; practically, they are not, because the health officer is merely the executive of the board. For example, the assistant health officer or clerk can only be removed "after notice and hearing by the common council for malfeasance in office, neglect of duty, incompetency or other just cause." This makes it practically impossible to remove him except by a process not calculated to do anything but prevent his removal. As he himself says, he has a "life job." The fact that the assistant health officer regards his position as a "life job" renders it difficult for the health officer to exercise discipline over him.

The milk inspector, though nominally under the direction of the health officer, reports directly to the board. He has his office in a local drug store and keeps all of his records there. There is no actual supervision of his work by the health officer; in fact the milk inspector is practically an independent officer, recognizing responsibility only to the board. The supervision which the board of health can give his work is only occasional, and cannot therefore be effective in improving the character or quality of inspection service, and because there are no records available in a form which will aid supervision by the health officer, no supervision is possible even through records.

The infant welfare nurse has her quarters in the health office, but in matters of her supervision the board is called into action rather than the health officer. The health officer, because he gives only part time to the work, is not always available to determine questions of policy regarding the infant welfare work. The physician members of the board or one of the ex officio members may be called in such cases by the assistant health officer, who is admittedly hostile to the infant welfare prgram, and uses his own discretion in the matter.

These facts clearly suggest the need, first, for a full time health officer who may actually supervise and direct the work of all employees, and second, for the centralization of administrative control in one officer rather than in a board of ten members.[1]

The employees of the health department are appointed by the board of control. The medical officer of health states, however, that it is his practice to conduct an examination for applicants for positions in the department and on the basis of these examinations to make recommendations to the board of control. For the purpose of examining applicants the medical officer of health appoints a committee of three made up of officers of the division to which the appointment

[1] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Stamford, Connecticut*, 1915 (printed), pp. 173-174.

is to be made. This committee prepares the questions and requires each of the applicants to submit written answers to the questions. The examination papers are not signed by the applicants, but applicants receive numbers which they enter on the examination papers. Each candidate is required to place his name in an envelope which bears his number and the envelop is then sealed, not to be opened until the medical officer of health has made his determination. The members of the committee submit their notes on the examination together with the examination papers to the medical officer of health who reviews the papers and the recommendations of the committee and grades the candidates. His recommendations as to appointment are then forwarded to the board of control for their decision.

This system is an admirable one but since the board of control is not bound to accept the recommendations of the medical officer of health it does not always happen that appointments are made according to his recommendations, and in the past many appointments have been made which were not approved by the health officer. There is, however, an evidence of gradual though slow improvement in the personnel of the department but such improvement in the future is in no way guaranteed. Under a new board of control, the old spoils system can very easily be again put into effect.

The inability of the medical officer of health to enforce discipline among his employees because of powerful influences which the employees are able in many instances to bring to their support in the board of control, is a very serious difficulty in promoting efficient health service and harmony within the department. A typical instance may be cited. One of the inspectors of the food division has been able to disregard the orders of his superior as to the making of inspections and the preparation of his reports because of political influence which he has been able to bring to his support. This inspector is not competent, as has been demonstrated, to do his work properly and recently at the recommendation of the medical officer of health he was retired on pension. Unfortunately, however, he was able to secure his own reinstatement by the board of control and to continue in service with the same indifference to the health officer's orders as before.[2]

Control by Service Records

In a municipal health department where the number of field employees is great and the area which must be covered by them in their daily routine extensive, the health officer cannot ordinarily keep all members of his force under his personal observation. If

[2] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Montreal, Canada*, 1917 (typewritten), pp. 1121-1122.

then, he is to exercise proper control of them he must depend largely upon daily records of their work. If the health service is organized according to its various functions with competent supervisors in charge of each functional unit, daily reports from individual employees should first be made to the supervisors in charge, reviewed by these officers, and then transmitted to the health officer with such comment as may be necessary.

A daily report should contain the following facts as a minimum: (1) time on duty, (2) work performed and results obtained, (3) the place where work was done, (4) any special or unusual circumstances noted by the worker in the line of his duty or otherwise, (5) expenditures made by the worker, if any. The reports should, if possible, be standardized as to form and arrangement of information so that they may be reviewed quickly and properly indexed and filed. Along with this daily work report of each employee, a personal record should be kept on which the following data should be entered: (1) name of employee, (2) age, (3) residence, (4) date of appointment, (5) previous education, experience and employment, (6) personal traits or habits, (7) general aptitude and special interests, (8) infractions of rules, disciplinary measures taken and other related facts, (9) capacity for leadership and direction of others, etc. The purpose of this record is to give the health executive evidence to support promotion, demotion, removal, or other disciplinary measures.

Not only does the maintenance of such personnel records make it possible for the health executive to know what his subordinates are doing and to appraise the value of their work, but it has a beneficial effect upon the worker. The worker who is required to account for his time is less likely to waste it. The very act of putting down on a report what he has done during the day compels the employee to make a certain self appraisal which is stimulating.

Training Health Employees

Unlike municipal police and fire departments, which have recognized the value of definite and purposeful instruction of new recruits, municipal health agencies have continued their traditional policy of letting the newly appointed employee become trained mainly by the trial and error experience plan. In relatively few cities has any plan of special training of health workers been inaugurated and in still fewer has training been developed to the

point where it can be described as a "course." When a new employee has been appointed for duties of an investigational or inspectional nature the usual procedure is for the health officer to give a few words of advice to the employee and then send him out, perhaps with a trusted "veteran," for instruction in method. This usually works well if the veteran is a competent instructor, but it should not be regarded as a substitute for formal instruction.

It is obvious that if the health employee is to furnish maximum service he must first of all be familiar with the laws, ordinances, rules and regulations governing his own acts and the acts of citizens with whom he must come in contact. Yet in many health departments it is impossible to find any compilation of such material that could be used by the employee even if he wished to do so. In some of the larger cities manuals of laws and regulations, with special instruction for employees according to the nature of their duties, have been prepared to meet this situation, but in the great majority of municipal health bureaus or departments, compilations of this kind are conspicuous by their absence.

The practice of holding frequent conferences between the health officer and members of the staff at which health problems are stated and their various solutions discussed is also a feature of training of proven merit, and one which could be adopted to advantage in every health department or bureau. The specialist in health service, whether nurse, physician, food inspector, sanitary inspector or other, is likely to become so engrossed in his own field as to overlook the fact that health service is a thing of infinite variety, and that if he is to be most useful in his own field he must be familiar with what others are doing in related fields. This means that he should not only know what the general program of disease prevention is and how it concerns him in his own work, but also the place it holds in the broader field of public welfare. Such knowledge is best gained by the conference method.

The health employee should know his own government, how it is organized, what it is expected to do, and how in his work he can make best use of the services of his own and other departments or bureaus. In the course of his inspections or investigations, he will note, if he is as observant as he should be, conditions which call for the attention of the police, firemen, poor relief officers, and others. He should have sufficient understanding of these services to know what action he should himself take, if any, and what the

citizen should be advised to do in his own behalf. He should be as familiar also with the services available to citizens at the hands of unofficial agencies as with those furnished by the city government, and should be capable of using intelligently all services, official and unofficial, when need arises. Training for work of this kind must be regarded as merely incidental to training which will perfect the health employee in the specific duties he is called on to perform as a paid employee of the health bureau or department, but it is a feature of his training which will decidedly enhance his health educational value to the community.

The failure of municipal health authorities to appreciate their great opportunities for training health workers as health teachers is well exemplified in the almost universal absence of adequate library facilities for employees' use. Even the great mass of unsolicited reports, bulletins, pamphlets, health journals, etc., which commonly comes to the health officer's desk, is only occasionally made use of for the instruction of employees. A few health officers find it profitable to review such material and to circulate especially interesting articles among their employees, but in most municipal health departments, the average employee has very little contact with the health world outside of his own limited section of it.

Retirement of Superannuated Employees

It is impossible to offer here extended comment on retirement plans for superannuated health employees. Health service requires on the part of its employees not only physical and mental vigor, but an enthusiasm for work and a capacity for adjustment to new ideas, not ordinarily found among employees of advanced age. Health employees who are too old to adjust themselves to the newer public health and its procedures should be retired, but few cities have made adequate provision for this. In some cities the health bureaus or departments maintain their own pension funds to which joint contribution is made by the city government and the employee. In others, special appropriations are made annually by the city government, and included in the health budget, to care for pensioners. In others, employees who are incapacitated are relieved of active duty but continued on the payroll as employees, and provided for in the budget from year to year. In many cities, however, the health officer is obliged to struggle along as best he may, often

with a corps of superannuated inspectors who continue to hold positions which should be vacated for younger and more active workers. The lack of a well founded, adequately financed pension plan, applicable to all public employees, is a serious handicap in municipal government, and in no phase of government service is this handicap more severely felt than in health service.

CHAPTER VII

FUNCTIONAL ORGANIZATION FOR SICKNESS PREVENTION

We have earlier seen that as the activities of municipal governments for the prevention of sickness became greater in number and more highly specialized, there was an inevitable tendency toward the bringing together of certain related and mutually dependent activities into groups which we have called health functions. The varied activities necessary for vital statistics registration and research represent the vital statistics function; those necessary for the registration, investigation, and control of communicable diseases represent the prevention of communicable disease function; those for the prevention of infant and maternal sickness and death, and for the betterment of child health in the preschool and school age period, the child hygiene function; those for sanitary inspection and regulation of milk, meat, and other food supplies, the food inspection function; those for inspection and regulation of environmental conditions and the correction of nuisances, the function of sanitary inspection; those designed to promote official and public interest and coöperation along all lines, the public health education function. In addition to these technical service functions, all of which have a direct bearing upon the prevention of sickness, another group of activities is to be defined as the function of general administration. This function includes all activities of an "overhead" nature, that is, those designed to correlate the technical service functions described and to promote good management of the health service as a whole. Included under this head are accounting, purchasing, general record keeping, general clerical and stenographic services, maintenance of plant and equipment, telephone, telegraph, postal, express, and other communication service, and similar activities.

In the great majority of municipal health departments, the organization of work for the prevention of sickness tends to conform naturally to this functional order. Assuming that the health department or health bureau of a department of public

welfare is concerned solely with the functions of sickness prevention, the following special service units, called bureaus or divisions, would ordinarily be provided in its organization: (1) administration, (2) vital statistics, (3) communicable diseases, (4) child hygiene, (5) food inspection, (6) general sanitation, and (7) public health education.

The Nomenclature of Organization

The question whether the special units of health work as above described shall be known as bureaus or divisions has, of course, no special significance in public health practice. It is, however, of some importance to have them so defined that it will be clear both to officials and the public just what their relation is one to another and to the general organization of which they are the component parts.

If we follow the federal plan of nomenclature descriptive of organization, each major branch of government is called a "department." Within a department there may be several "bureaus." Each bureau may include several "divisions," and each division several "sections." For example, if there were an independent department of health in the city, each major functional unit of it, according to the federal scheme of nomenclature, would be known as a bureau and each subordinate unit of a bureau would be known as a division. If further differentiation of divisional activities were desired, special sections of divisions might be named. If, on the other hand, the health service represented merely a major unit of a department of public welfare, it would be known as a bureau of health. Within such health bureau each function would be represented by a division and each division might be divided into several sections.

In municipal practice, however, the scheme of nomenclature above described is not uniformly followed. The term department is sometimes used carelessly to denote a subdivision of a department, as a "department of child hygiene" of a department of health. Bureau and division are also used interchangeably to designate any minor unit of a department regardless of their relative rank in the organization or of their relation to the organization as a whole.

In the designation of the officials of government there is even less uniformity in the use of terms. The administrative head of a department is commonly called a "commissioner" or "director."

In commission governed cities, the members of the city commission sometimes take the official title of director, as director of public safety, and director of public affairs. Where the titles commissioner and director are pre-empted by members of the city commission, it is confusing to the average citizen to find the heads of the special service units under their administrative direction also called commissioners or directors. Sometimes the executive in charge of a department is called a superintendent; sometimes this title is given to the chief of a bureau or division of that department. In public health organization, however, the technical head of the health service, whether that service be an independent department or a bureau of a department of welfare, is best known as "health officer." This title is recognized in law and in common usage, and its use is recommended by the American Public Health Association.

Good practice would seem to be to give the title "commissioner" to the head of a department except when this title has specific application to a member of a city commission governing body. The title "director" should, perhaps, be reserved for the officer in charge of a bureau of such department; the title "superintendent" for the officer in charge of a division, and the title "chief" for the officer in charge of a section or subordinate unit of a division.

It may appear that this subject of nomenclature has been somewhat overstressed, but unless the reader has a clear idea of how these terms are used in government the picture of government which he may draw in his mind's eye is likely to be a very confused one.

A Typical Functional Organization of Municipal Health Service for Sickness Prevention

It is apparent that although all municipal health departments have substantially the same functions to perform, there will necessarily be some variations in the number of special units established to perform them. In a small municipal health organization consisting, perhaps, merely of a health officer, a nurse, and one or two health inspectors any such differentiation of bureaus or divisions as has been described would be an absurdity. As the community increases in size, however, and the work of its health personnel becomes more highly specialized, the health organization tends quite naturally to divide itself along such functional lines. As more activities are taken on, the health officer must necessarily delegate authority to subordinates who are especially skilled or

experienced in the various functional groups of activities. Eventually, a point may be reached where all the bureaus or divisions enumerated or more will be recognized as necessary, and each will doubtless need to be put in charge of a technical expert on the particular matters with which it is concerned.

In a large city, the number of special activities which are included within each major functional group may be so great and their nature so varied that the health officer finds it desirable to establish other bureaus or divisions in addition to those mentioned. It may, perhaps, be desirable to establish separate bureaus or divisions of laboratories or hospitals, or it may be in the interest of better health control to take out of a general bureau or division of food inspection those activities which have to do particularly with milk control, and set them up as a bureau or division of milk inspection. If tuberculosis or venereal disease control are matters of major importance in his community, the health officer may decide that these special services should have bureau or division rank. It may be unnecessary to have a special bureau or division of public health education and health educational work may be carried on merely as a special section of a bureau of general administration. This is the case in the majority of cities.

A good illustration of the functional type of health organization described is that of the New York City health department. From the beginning of the reorganization of the New York City health department on a functional basis, which dates from the establishment of the division of child hygiene in 1908, there has been a constant trend toward the coördination of related technical activities in well defined bureaus or divisions. Under Dr. S. S. Goldwater as health commissioner in 1914, all health activities of the department were finally brought together in nine bureaus, namely, the bureaus of records, sanitation, infectious diseases, laboratories, child hygiene, food inspection, health education, and hospitals, each of which was in charge of a full time technical director. Some minor changes have been made in this organization since that time. The bureau of health education is now merely a special division of the bureau of general administration, and the name of the bureau of infectious diseases has been changed to bureau of preventable diseases, in recognition of the added responsibilities of the bureau for control of preventable diseases of a noninfectious character. Otherwise the organization remains substantially the same as when reorganized in 1914.

An "Ideal" Health Organization

In the report on municipal health department practice in 83 American cities of 100,000 population and over, to which previous reference has been made, an organization for an "ideal health department for a city of 100,000 population" was suggested by C-E. A. Winslow, and H. I. Harris, as follows:

1. Bureau of administration:
   a. Division of administration,
   b. Division of health education.
2. Bureau of sanitation.
3. Bureau of foods:
   a. Division of milk inspection,
   b. Division of foods (general).
4. Bureau of communicable diseases:
   a. Division of epidemiology,
   b. Division of tuberculosis,
   c. Division of venereal diseases.
5. Bureau of child hygiene:
   a. Division of infant welfare,
   b. Division of school hygiene.
6. Bureau of public health nursing.
7. Bureau of laboratory.
8. Bureau of vital statistics.

In the ideal health department as suggested, communicable disease hospital service is included as a special service unit, but is not given bureau rank or title.

This outline of a functional organization for sickness preventive work is a thoroughly logical one, but like all ideal organization plans, it must be revised here and there to meet the needs and resources of different cities. We may, however, accept the plan as embodying the most recent thought on the subject. Each of the bureaus listed and their divisions represent groups of activities which are required in practically all good health organizations, although they are not always so particularly defined. As already noted, health educational work is frequently given bureau rank instead of being included as a special division of a bureau of administration. Child hygiene and public health nursing activities, instead of representing two separate bureaus as in the above outline, are more often organized as a single bureau, because the greater part of the work of public health nurses is in the promotion of child

health. The communicable disease hospital or hospitals, if administered by the health authority, may also be given coördinate rank with other bureaus by being placed under a bureau of hospitals.

We have already considered in detail most of the overhead activities which in the above outline are represented by (a) the division of administration of the (1) bureau of administration. The other activities, functions, and relations of the health organization for the prevention of sickness will be discussed in subsequent chapters in the following order: vital statistics, prevention and control of disease, child hygiene, and public health nursing, food inspection, sanitary inspection, the public health laboratory, public health education, health expenditures and revenues, and the relation of municipal health services to other official and unofficial agencies. Communicable disease hospital service will be considered in Part III, which deals with curative health functions as performed by hospitals, dispensaries, and other related institutions and agencies. The communicable disease hospital is a most important element in the prevention of sickness, but because of its institutional character, it is better dealt with, from the administrative point of view, as merely one unit of the municipal sickness treatment system.

CHAPTER VIII

VITAL STATISTICS

Vital statistics registration has been well characterized as the bookkeeping of health. In the same way that good business management requires current recording and periodic analysis of the facts about business operation and trends, so good management of public health work requires the recording and analysis of certain facts about human life and death. In their practical application to public health administrative purposes, we shall regard vital statistics as concerned primarily with the registration and interpretation of the facts about birth, sickness, and death. Although there are many other vital facts, such as those about marriage and divorce, which belong properly to vital statistics, and are commonly included under this head, these are not of major significance in public health work, however valuable they may be for other purposes of social control.

The laws of all states require formal registration by some authority of births and deaths, and there is, in general, uniformity of registration methods. The facts about morbidity, or sickness, which are available for health purposes are, however, limited mainly to those which concern certain diseases called "notifiable," that is, those of which health authorities must be notified, in order that the measures necessary for public protection may be instituted. Although the lists of such notifiable diseases vary considerably in the different states, all states require physicians and others having knowledge of the diseases described as "communicable," "contagious," "infectious," or otherwise "dangerous to public health," to report them to the proper health authorities of their communities.

The importance of putting the registration of all vital facts of birth, sickness, and death in the hands of the health authority of the community is now generally recognized but, as we shall see, this is not universally the practice.

Health Authority Should Be Registrar of Vital Statistics

The recording of births and deaths is essentially a state function. In every state some officer of state government is designated as registrar of vital statistics and in local districts of the state, officials are appointed by the state registrar as local registrars of vital statistics. The latter are required to transmit periodically to the state registrar the returns which they receive from persons required by law to make them. In a majority of states, the state health officer or some representative of the state health authority is the state registrar, and in many local units of government, also, the local registrar is the health officer or a representative of the local health authority there having jurisdiction. There are, however, a few cities in which responsibility for the registration of births and deaths, together with marriages and divorces, rests with city clerks or other lay officers, as it did generally before the importance of such records for public health purposes had been recognized. The disadvantage of such procedure is apparent from the following illustration:

Newark is still laboring under an antiquated and uneconomic system of vital statistics registration and control. The fact that official responsibility for vital statistics registration, that is, the registration of births, marriages, and deaths, is placed in the hands of the city clerk makes it necessary for much of the work of the city clerk's officer to be duplicated by the vital statistics force now attached to the executive division of the health department. . . .

This matter has long been one of controversy between the health officials and the city clerk. Without discussing the arguments raised by either party to the controversy, it must be said that the present procedure is wasteful of money, and is further not in keeping with the best modern practice. The state health department of New Jersey has recognized its responsibility for control of vital statistics and has a special vital statistics bureau. The city health department needs all records of births and deaths for its own work in protecting community health. Efficient public health work finds its basis in complete and accurate data regarding births and deaths, and lacking complete control over registration of births and deaths its efficiency is seriously handicapped.

It is recommended, therefore, that all vital statistics work now performed in the city clerk's office be transferred to the department of health, and that a special division of vital statistics be developed in the proposed bureau of health and hospitals, to receive and record

births, marriages, and deaths, and to issue certified copies of such records, burial disinterment transportation permits, etc. Such a division would require a chief statistician and at least three trained assistants. This force should be ample, provided modern methods of handling records are adopted.[1]

The Procedure of Registration of Births and Deaths

In order that there may be uniformity throughout the various states in the recording of facts about births and deaths, and to make possible comparison of the vital facts about the populations of the many registration districts of the country, the United States Bureau of the Census has proposed a model vital statistics law for adoption by the states and enforcement by the state and local health authorities, which requires the use of standard certificates of births and deaths. When a state has made proper provision for registration of births and deaths, as recommended in the model law, and has produced, as the result, a registration of births and deaths satisfactory to the Bureau of the Census, that state is admitted to the "Registration Area for Births and Deaths." If only the state's birth registration is approved, it is admitted only to the "Registration Area for Births"; if only its death registration is satisfactory, it is admitted only to the "Registration Area for Deaths." According to the last available reports of the Bureau of the Census, the "Registration Area for Births" now comprises 75.9 per cent of the estimated population of the United States, and the "Registration Area for Deaths," 91.6 per cent of the population. It is the aim of the Bureau of the Census to bring 100 per cent of the population into the registration areas by 1930, the date of the next census.

It will be noted that the "Registration Area for Deaths" includes a much greater population than the "Registration Area for Births." This is because good registration of deaths is more readily secured in most communities. The dead must be buried, and even in the most sparsely settled areas burial without the cognizance of officials is well nigh impossible. In all organized communities the removal of a body from the place of death and its burial must be a matter of record, since the undertaker must secure an official permit for its removal. On the other hand, even in well organized

[1] New York Bureau of Municipal Research, *A Survey of the Government, Finances, and Administration of the City of Newark, New Jersey*, 1919 (typewritten), pp. 236-237.

and thickly settled communities, a child may be born without the knowledge of any one except its parents or their intimates. In many instances, and for obvious reasons, birth may be concealed. Even where there is no attempt at concealment of birth, it may pass unnoticed in rural areas for a long time. So it is far more difficult for states with large rural populations to meet the requirements of the Bureau of the Census with respect to birth registration.

In those states not within the registration areas, the method of recording births and deaths varies considerably, although all use record forms which conform more or less to the standard certificates approved by the Bureau of the Census. The standard certificates are sent out by the state registrars to local registrars and furnished by the latter to physicians and others responsible for reporting. In the case of a birth, the physician, midwife, or other person attendant at birth is required to secure the necessary information, enter it upon the standard form, sign his or her name to the document and transmit it to the local registrar within a given time after birth, usually from one to ten days. In the case of a death, the identifying information required by the standard form is usually filled in by the undertaker. Those facts which have to do with the medical diagnosis of the cause of death are supplied and attested by the attending physician. The completed record is then delivered to the local registrar either by physician or undertaker. The rule is that not more than twenty-four hours may elapse between death and the filing of the death record. The undertaker is usually prompt to attend to the matter as soon as the physician has supplied the cause of death and endorsed the certificate, since burial cannot be made until the report has been filed and a burial permit obtained from the registrar of vital statistics.

When the properly filled out and endorsed certificates of births and deaths have been received by the local registrar, the usual practice is for the registrar to make copies of them for filing in the local office and to send the originals to the office of the state registrar. In most cities these copies are made in long hand or on the typewriter by clerks in the office of the registrar. In a city with 100,000 population this means copying perhaps fifteen or twenty records of births and deaths daily and the clerical work is, therefore, not a considerable burden. In some of the largest cities it has been found more satisfactory and economical to make photo-

graphic copies of the records. This eliminates errors which often occur in copying the certificates.

In some cities the required copies of records are merely transcriptions to record books; in other cities they are copies upon forms similar to the original forms, serially numbered, and bound in volumes indexed by months or years. A special card index of the records is usually maintained so that when a certified copy of a record is demanded by a citizen, the registered file copy may be quickly found. Certified copies of birth and death records are frequently needed by citizens as evidence for one purpose or another. These are furnished by the registrar for a fee, usually 50 cents for each copy. They are called certified copies because they are formally certified by the registrar as being true copies of the original record.

One of the most important duties of a local registrar is to examine all reports of births and deaths as they are received, note errors of statement or incompleteness of statement or other failures on the part of makers of the reports to conform to standard approved practice, and to see that such errors, omissions, or other inaccuracies are corrected before final record is made. These standard report forms have been developed with the thought of reducing the number of facts required about births and deaths to the minimum actually needed for proper and necessary statistical purposes and health research. Any omissions or inaccuracies should, therefore, be guarded against. As an aid to physicians and others making the reports, the Bureau of the Census has issued special instructions on the terms to be used in the reports, and the manner of using them. A brief summary of these instructions is often printed on the back of the certificate of birth or death.

Procedure of Sickness Registration

The registrar of vital statistics does not as a rule receive the reports of notifiable diseases which are sent to the health authority by physicians and others responsible for notification. These reports are in most cities sent directly, either by telephone or in writing, to the officer in charge of disease control work, as the head of a bureau or division of preventable diseases. The laws of the various states differ with respect to the nature of the information which the physician or other person is required to furnish regarding patients with communicable or other notifiable diseases, but all

require at least the name and address of the patient. The name of the disease may or may not be required.

Where other information is needed for purposes of control, health inspectors or nurses are sent out to secure it. All information thus obtained is recorded and the records are kept in the possession of the officer responsible for control procedure. Up to the time of the termination of the case, that is, the release of the patient from official control, the vital statistician may have little to do with these records. It is, however, good procedure for the records of all "closed" cases to be sent to the registrar so that the facts which they contain may be properly summarized for the information of the health officer and the public. We have, therefore, considered here the analysis of sickness records as a part of vital statistics procedure.

As in the case of births and deaths, it is highly important that there be uniformity of procedure among cities with respect to the particular diseases reported and the kind of information furnished, if the information about sickness be valuable in its prevention or for purposes of comparison. To this end a "model law" for registration of preventable diseases has been proposed and is gradually coming into general use. We shall describe this model law in greater detail in the next chapter.

The Importance of Complete and Accurate Birth Registration

Although a state may be admitted to the "Registration Area for Births" upon evidence satisfactory to the Census Bureau that 90 per cent of its births are properly recorded, 100 per cent registration of births should, of course, be the aim. If, in a city of 100,000 population, with a total of 2,500 recorded births, it is estimated that about 10 per cent of births escape registration, there are then possibly 250 or more infants unregistered as to birth each year. This means that these unregistered babies, and their mothers, will probably not receive the attention of the health authority at the very time when they may most need such attention. Furthermore, the mere fact that a birth is unreported gives ground for suspicion regarding the circumstances of birth. Perhaps no physician or other competent obstetrical attendant was present; perhaps the child was illegitimate and concealment of birth was intended; perhaps the parents were ignorant of their duty both to report the birth and to provide satisfactorily for the child's health protection. The importance in other respects of complete and accurate regis-

tration of births is well illustrated in the comment made by the health officer of Rochester, New York, on birth registration in his own city.

In 1913 a statement was made in the annual report that of the 582 children who died under one year of age 7.3 per cent were found upon the birth register to have been unreported. Just about the same percentage of births were unreported this year, and just about the same men are criminally careless in their failure to report births. No man has ever been successfully prosecuted for failure to report births, even though it could be shown that due to his failure to report birth a woman with her two children had been compelled to remain in a foreign country because she could not prove that her children were born in America. No punishment has ever been meted out to these men, even though it could be demonstrated that a woman, the wife of a soldier, had been denied the pittance of a pension because of the doctor's negligence to record their children's births and thus declare them officially born. As a final example of the suffering brought about as a result of carelessness in the reporting of births, we find the case of an American citizen, who, when abroad, was compelled to serve in one of the European armies because he could not prove by a birth record that he was an American citizen. His wife is left a widow with two children because the doctor did not report the birth of this man.[2]

Although there has been a tremendous improvement in birth registration in all states and cities as is evidenced by the steadily growing "registration area" for births, there are still many cities where birth registration procedure shows little that is commendable. As recently as 1919, birth registration in the large city of Wilmington, Delaware, was such as to prevent its enrollment by the United States Bureau of the Census as a registration city. The following excerpt from a report on health administration in this city illustrates about every possible defect of procedure.

The first serious criticism of the registration of births is that the present law is not enforced. Under the law physicians and midwives are required to file a certificate of birth "properly and completely filled out" on the standard form prescribed by the United States Bureau of the Census *within ten days* after the date of birth. Neither physicians nor midwives obey this law. Out of 169 birth certificates returned to the board of health in two months of 1918, 83 or 49 per

[2] New York Bureau of Municipal Research, *Government of the City of Rochester, New York,* 1915 (printed), pp. 310-311.

cent, constituted violations of the law by physicians or midwives in that they were not reported within the ten-day limit prescribed.

It is further evident that many births are not reported at all. To determine this fact all deaths under one year, including stillbirths, in 1917, 511 in all, were checked back against the birth register to determine how many of the children who died before one year of age were actually not reported at birth. It was found that of the 511 deaths under one year, inclusive of stillbirths, there was no record as to birth in 171 cases, or at least the examiner could find no such evidence.

That this finding may be somewhat in error the examiner admits, but the responsibility for error, if any, must be placed upon the records themselves. In many instances the name of the child as found in the birth register did not agree with the name in the death register and this constitutes one possible source of error. The fact that the births had not been reported promptly in compliance with the law made it extremely difficult in many cases to find the proper entry of birth. For example, the birth record of a child who died at seven months of age on April 1, 1918, should, if birth had been properly reported, be found in the register under the month of September preceding and in the record of the first ten days of that month. But because physicians and midwives frequently delayed reporting more than the allowed ten days, this method was not always applicable. Here was another possible source of error. Again, another source of error exists in the method of arrangement of the register. The birth register instead of being indexed alphabetically for the entire year is indexed quarterly. That is, there are four lists of names beginning with A, four with B, four with C, and so on. This is done because the original records are sent to the state registrar each quarter. It was therefore necessary in checking back from the deaths to the births to look in several places for the name, and the multiplication of work meant, of course, the multiplication of possibilities of error. Finally, there were a number of deaths of infants found dead in the streets or parks, probably stillborn, for which no birth records or other information had been secured, although some evidence should have been obtained through the investigations by the coroner or police authorities.

It is with some hesitancy that these figures are presented, since there are so many possible sources of error, but the figures here given do represent, in the opinion of the investigator, a most deplorable lack of efficiency in vital statistics registration. If out of 511 deaths under one year there were actually 171 infants which had not been registered as to birth, it indicates that the reporting of births in Wilmington is probably less than 70 per cent efficient. This is by no means a respectable record.

Not only were some births not reported and the filing of certificates for others delayed beyond the ten days which the law allows, but in many cases the records were otherwise not "properly and completely filled out" as the law demands. Many certificates were not dated, in others the dates of filing were so blotted by the stamp of the registrar that it was impossible to make out the date. In several instances the address of the parents was merely given as Wilmington, although the street address is required. In two instances birth returns unsigned by either physician or midwife were accepted; and in other instances they were not endorsed by the registrar as required. All of these defects indicate an unpardonable carelessness in the making out of certificates as well as in the procedure of their filing.[3]

Methods of Improving Birth Registration

The first thing in securing good registration of births is to have a law requiring that births be reported by physicians, midwives, and others responsible within twenty-four hours, or forty-eight hours at the most. In many cities the public health law requires merely that birth reports shall be made within ten days after birth, and in a few cities even longer delay is permitted. If those responsible for reporting births are required to do so within twenty-four hours, more births will certainly be reported than if the matter may be put off for ten days or more. Furthermore, since many of the deaths of infants occur in the first week of life it is of the most vital importance that the health authority be informed of all births at the earliest possible date.

In Rochester, New York, Dr. George W. Goler, the health officer who has campaigned continuously and successfully for better birth registration, advertised its importance by posting the following placard in street cars and other public places.

IS YOUR BIRTH REGISTERED?

If Your Birth Is Not Registered at the Health Bureau
You May Not Be Allowed to

Go to School	Hold Public Office
Leave School	Leave a Foreign Country
Go to Work	Re-enter Your Own Country
Vote	Inherit Money or Other Property
Marry	Receive Compensation Insurance

Is Your Birth Registered? Ask the Health Bureau. Did the Doctor Promptly Report Your Birth?

[3] New York Bureau of Municipal Research, *A Survey of the Government of the City of Wilmington, Delaware,* 1919 (typewritten), pp. 285-288.

In many cities, Rochester among them, it is routine procedure for the health officer to send to the parents of each child whose birth is reported a certificate to that effect. In Montclair, New Jersey, these certificates, which are nicely engrossed and adorned with the city seal, are found to be of great value in improving registration of births particularly among the foreign born. The certificates were regarded as "diplomas" and the mother who fails to receive one is prompt to inquire why the health office has not acknowledged her claim to recognition.

It should be routine procedure also, in all vital statistics offices, on receipt of a certificate of death of a child under two years of age, to examine the birth register to see if the child had previously been reported as to birth. If no birth certificate has previously been filed, steps should be immediately taken to complete the record. This check upon the completeness of birth registration is a most valuable one, and if it is made as a matter of routine on all deaths of children under two years of age, a fairly good estimate can be made of the completeness of birth reporting. An examination of the birth register should be made as well for all living children when first they come to the attention of the health authority through sickness or otherwise. When children first enter school, it is routine procedure to require them to present certified copies of birth records, but many children whose births have not been reported may be found before this time, if proper inquiry is made by nurses, inspectors, and others on their rounds of the community.

The registration of the births of all children is regarded as so essential by many health officers that they have sometimes found it worth while to make a complete house to house canvass and a search of the birth records for every child so found. This procedure imposes a considerable burden upon a field force and would not perhaps be warranted unless all other procedures which might be carried on as routine were unavailing.

The publication of birth notices in the daily papers is another method of value in securing better birth registration. Parents of newborn children who fail to find their names in the paper are likely to make inquiry at the health office which is responsible for giving the records to the newspapers. In some cities, however, such publication has been found of disadvantage in securing registration of illegitimate children. The parents of illegitimate children are naturally reluctant to have their unwedded state exposed,

and publication of birth records in such cases might handicap rather than aid the health officer in securing the coöperation of parents.

Occasional examination of the baptismal records of churches is often resorted to by health officers as a further check upon birth reporting. In Montreal, Canada, for instance, a study of birth registration made by the writer in 1918 showed this to be a most necessary feature of the campaign for better registration of births. At the time of this study the provincial law did not require civil registration of births. The great majority of the population were French and communicants of the Catholic Church, which maintained its own birth registration system. Illegitimate births were many in Montreal and these especially were rarely reported to the health authority although a vital statistics office was maintained in the health office. All births among their parishioners were, however, fully recorded by the Catholic Church. The church records were regarded as confidential and were not published although available to the proper city officials.

The success of the health authority's effort to secure complete birth registration will, however, depend in any case upon conducting a continuing program of public education regarding its importance to the public health and the benefits which registration of birth otherwise confer upon the individual. The newspapers should be enlisted and all other possible media of public information taken advantage of in this work.

The Importance of Uniformity in Certifying Causes of Death

Death registration must conform to the procedure recommended by the United States Bureau of the Census if statistics of mortality are to be of any use to the health authority, either in preventing other deaths or for purposes of comparison. No death certificate should, therefore, be accepted for final registration by a registrar of vital statistics until it has been carefully reviewed and all inaccuracies and omissions noted. If the physician or other person reporting death has failed in any respect to conform to the standard required procedure, he should be so notified by the registrar and opportunity given him to make the necessary correction. Since the death report is a document frequently of great legal importance, the registrar should make no material corrections or alterations of the record on his own responsibility.

A major difficulty in securing complete, accurate, and comparable

statistics of death is that of obtaining from physicians statements of the causes of death which can be relied upon for public health purposes. It is obvious that unless some standard scheme of nomenclature for the causes of death is used by physicians generally, proper statistical calculations and comparisons of mortality are impossible. The Bureau of the Census, has, therefore, in coöperation with committees representing organized bodies of physicians and public health authorities in this country and abroad, recommended for use by physicians the "International List of the Causes of Death." This list includes at present 205 titles of causes of death arranged according to their nature in fifteen groups. Pamphlets containing this list with instructions how to use its titles are published by the Bureau of the Census and are sent to all physicians; and it is the duty of registrars to see that statements of the cause of death made by physicians conform to the titles of the International List. For example, a statement that the cause of death was "tuberculosis" is not regarded as satisfactory because "tuberculosis" in the International List embraces seven titles, namely tuberculosis of the respiratory organs, of the meninges and central nervous system, of the intestines and peritoneum, of the vertebral column, of the joints, of other organs, and disseminated tuberculosis. Similarly a statement that death was due to "cancer" is an incomplete statement because this disease has also several different qualifying designations indicating the part of the body affected, a fact of considerable importance in suggesting the tendencies of the disease. There are also many terms in common use by physicians which have no standing in scientific medical nomenclature, and physicians are advised not to use them in their reports of the causes of death.

The following excerpt from a report on vital statistics registration in Grand Rapids illustrates how impossible it is, where death registration is faulty, either to make a satisfactory statistical analysis of the causes of death or to determine what action should be taken by the health officer for the prevention of conditions responsible for death.

Review of the death records in the health office shows many irregularities. For example, we find the occupation of the decedent frequently recorded as "laborer" although the specific instructions printed on the back of the standard certificate state clearly that this designation is unsatisfactory for statistical uses. Printed at the top of the back of the certificate is "Exact statement of occupation is

very important." The reason for this admonition is readily understood, if, for example, the death is due to disease or injury resulting from some industrial operation or process.

The instructions on the certificate advise also strict conformity in statements of the causes of death to the "International List of the Causes of Death," copies of which with full instructions as to its use may be obtained from the United States Bureau of the Census. Many improper statements of the cause of death are found uncorrected in the records such as "acute indigestion," "inanition," "marasmus," "congestion of the lungs," "intestinal indigestion," "blood poisoning," "catarrhal fever," "general infection." Many of the statements of the causes of death are improperly spelled thereby increasing the difficulty of classifying them. These errors in statement of the causes of death remaining uncorrected account for some of the many variations between the deaths from certain causes as reported by the local health department, the state health department, and the United States Bureau of the Census. To be of any value in estimating disease conditions in Grand Rapids, deaths must of course be accurately classified. That they are not so classified now is clearly demonstrable from the reports of the health department.[4]

Birth, Death, and Sickness Rates

For determining the health status of a given community and for certain comparisons of the vital facts about one community with those of another, vital statisticians make use of certain general and specific rates. For discussion of all of these rates, the reader should consult one of the standard texts on vital statistics.[5] We shall, however, consider here, briefly, only those birth, death, and sickness rates which are commonly presented in the report of state and municipal registrars of vital statistics.

Two classes of rates are to be defined, namely, general and specific rates. Of the general rates there are two in common use, namely:

1. *The general annual birth rate* is the yearly number of recorded births (exclusive of stillbirths) for each 1,000 population of the registration district. This rate is derived as follows:

$$\frac{\text{Recorded births}}{\text{Total population}} \times 1{,}000 = \text{Birth rate per } 1{,}000 \text{ population.}$$

[4] New York Bureau of Municipal Research, *Report on Grand Rapids Health and Hospital Survey*, 1923 (typewritten), p. 66.

[5] I. S. Falk, *Principles of Vital Statistics*, 1923; G. C. Whipple, *Vital Statistics*, 1923.

2. *The general annual death rate* is the yearly number of recorded deaths (exclusive of stillbirths) for each 1,000 population of the registration district. It is derived as follows:

$$\frac{\text{Recorded deaths}}{\text{Total population}} \times 1{,}000 = \text{Death rate per 1,000 population.}$$

The specific rates which we shall discuss here are:

1. *The annual infant mortality rate* is the yearly number of recorded deaths of infants under one year of age (exclusive of stillbirths) for each 1,000 reported births (exclusive of stillbirths) in the registration district. It is derived as follows:

$$\frac{\text{Recorded deaths under one year of age}}{\text{Total recorded births}} \times 1{,}000 = \text{Infant mortality rate.}$$

2. *The annual specific death rate from each of the various causes of death* is the number of deaths from each cause for each 1,000 or 100,000 population in the registration district. The specific death rates of greatest health importance are those of the notifiable diseases. Hundred thousand population is better used as the unit in this instance in order to avoid fractions less than one. The rate is calculated thus:

$$\frac{\text{Recorded deaths from given cause}}{\text{Total population}} \times 100{,}000 = \text{Specific death rate for given cause.}$$

3. *The morbidity rate from each of the various notifiable diseases* is the number of recorded cases of each disease for each 1,000 or 100,000 population in the registration district. Hundred thousand population is better used here, also, for the reason given in the preceding paragraph. The rate is derived as follows:

$$\frac{\text{Recorded cases of given disease}}{\text{Total population}} \times 100{,}000 = \text{Morbidity rate of given disease.}$$

4. *The fatality rate for each notifiable disease* is the number of deaths occurring among each 100 reported cases of the disease,—in other words, the percentage of deaths from each disease. It is calculated as follows:

$$\frac{\text{Recorded deaths from given disease}}{\text{Recorded cases of given disease}} \times 100 = \text{Fatality rate of given disease.}$$

Stillbirths and Their Registration

It will be noted in the foregoing summary of birth, death, and sickness rates in common use that, in calculating the general birth rate, the general death rate, and the infant mortality are, stillbirths are excluded from the totals of both births and deaths. A stillbirth is an infant born dead. The physician or other person responsible for reporting the fact is required, according to standard procedure, to report it as a birth upon the prescribed birth registration form and also as a death upon the death registration form. The stillbirth is not, however, included by the registrar of vital statistics in his totals of either births or deaths for statistical purposes. The birth report and the death report may be said to cancel each other. An infant born dead is recorded merely as a stillbirth in a separate register.

It is considered in medical practice that the death of the fetus *in utero* is a miscarriage if death takes place prior to the sixth or seventh month, at which time it is viable or capable of life after birth. The fetus dying after that time is, in the common understanding of the term, a stillbirth. The state laws, however, vary considerably with respect to the requirement of reporting deaths *in utero*. In a few states there is no legal definition of a stillbirth; in others the law requires physicians to report the fact as both birth and death even though death occurred in the fourth or fifth month of pregnancy. It is apparent that unless care is taken by all registrars to exclude all stillbirths regardless of the period of gestation at which death occurred, comparisons of birth and death rates are likely to lead to very erroneous conclusions. It is also apparent that comparisons of numbers of stillbirths in proportion to total births should not be made unless the varying requirements of the states are taken into account, since the total stillbirths recorded would depend on what the state law defined as a stillbirth to be reported.

The significant thing about stillbirths is that they represent deaths which are largely preventable. There are many factors which contribute to the death of the fetus, such as the lack of adequate obstetrical care and the lack of prenatal instruction of mothers, the ages of mothers and their physical health and ability to bear and give birth to children, conditions of maternal environment and occupation which produce mental or physical stress, and many others. Stillbirths are greater in proportion to total births

among negroes in this country, chiefly because of their disregard of sex hygiene, early pregnancies, and general ignorance of health and sanitation. Illegitimacy is high among negroes; where there are many illegitimate births there are usually many stillbirths, for obvious reasons. Whatever the factors are which contribute to fetal death, it is certain that many of them can be prevented by efficient public education and the provision of facilities for good obstetrical care at public expense for those women who cannot otherwise obtain it.

For a detailed analysis of statistics of stillbirths and the significance of the various factors named as contributory to fetal death, the reader should consult the reports of the United States Bureau of the Census.[6]

Estimating Population for Determining Birth, Death, and Sickness Rates

It is clear that unless birth, death, and sickness rates are based upon reasonably accurate estimates of population, they are likely to misrepresent conditions. It is by no means uncommon for city "boosters" to pad estimates of population for purposes of propaganda. A few thousand added to the population in a small city may mean a considerable decrease in the birth, death, and sickness rates as calculated, and, therefore, a more favorable showing with respect to health conditions.

The basis of population estimates is the federal census which is taken every ten years, the last in 1920. In a few states it is customary to make an enumeration of population during the fifth year between the federal census takings. New York State has just completed such a state census for 1925, but the enumeration has been severely criticized by many city officials, and it is likely that most vital statisticians of the state will continue to use the federal census of 1920 as the basal figure from which estimates for current calculations will be made. It is not uncommon to hear such criticism of enumerations which are made by state or local authorities because they are usually made hurriedly and by a corps of relatively untrained persons. The federal census organization is, however, a continuing one, whose enumerators are carefully drilled and whose directing staff comprises some of the ablest

[6] United States Bureau of the Census, *Birth, Stillbirth, and Infant Mortality Statistics for the Birth Registration Area of the United States* (latest issue).

statisticians of the country. So it is probably better to use the federal census figures in all cases.

For estimating population in intercensus years the arithmetical method is most often used, because of its simplicity. This method assumes a uniform change in population numbers during the periods between enumerations. The census figure of 1910 is subtracted from that of 1920 to obtain the total increase for the period. Dividing the total increase by ten gives the average annual increase for the years between, assuming a full ten year interval between census dates. The population estimate then for 1925 would be the sum of the 1920 census figure and five times the average annual population increment. For example, if the population was 100,000 in 1910, and 110,000 in 1920, the average annual increment would be 1,000. In 1925, then, the population would be estimated as follows: 110,000 plus 5 times 1,000, or 115,000.

This method of estimating population is not, of course, a strictly accurate one for it does not take into account sudden changes in population through immigration, emigration, economic depressions, marked variations in birth and death rates, etc. It does well enough for practical purposes, however, and is the method in use by the majority of registrars of vital statistics. Since the period between federal census takings is not a full ten years, a correction should, however, be made in estimating population in intercensus years. The date of the federal census is fixed "as of" a given day and this date may change from one census year to another. The federal census of 1910 was "as of April 15, 1910"; that of 1920 was "as of January 1, 1920." There was, therefore, a period of only nine years, eight and a half months between these two dates. Assuming then that the 1910 census showed a population of 100,000, and that of 1920, 110,000 population, an increase of 10,000 population in the given city for the intercensus period, the average annual increment would be 10,000 divided by 9 17/24 years, or 1,030. The estimated population on January 1, 1925 would, therefore, be the 1920 population, 110,000, plus 5 times 1,030, or 115,150.

The graphic method of estimating population in intercensus years is an even simpler one, and is sufficiently accurate for ordinary purposes. Cross section paper is used and the curve of population at the federal census years is plotted and extended beyond the 1920 point. The estimated population for the intercensus year is then found by taking a point on the population scale which corresponds to the height of the plotted curve at that particular year.

Another method of estimating population, called the geometric method, is sometimes used, but it is not so easily understood by the layman, nor does its use offer any particular advantage over the methods already described. The simplest rule is to use the logarithms of population in the same way as the actual numbers are used in the arithmetical method. The logarithm of the population figure in 1910 is subtracted from the logarithm of the population figure of 1920. The difference is then divided by the number of years between the census of 1910 and 1920. To obtain the estimated population for 1925, the quotient thus obtained would be multiplied by five and the product added to the logarithm of the 1920 population figure which gives the logarithm of the answer. All that is necessary in estimating population by this method is a logarithmic table and knowledge of how to use it.

The Birth Rate and Its Significance

Birth rates in American cities vary from about 18 per 1,000 to as high as 34 per 1,000 population. As these rates are based on *reported* births, it is obvious that the efficiency of reporting births must always be taken into account when comparing birth rates. Although there are notable exceptions, it is the rule that birth rates are higher in cities having the larger numbers of foreign-born peoples and, of course, in those having the larger numbers of women in the child-bearing period of life. The character and composition of the population, the number of marriages, the ages of those who marry, the duration of the child-bearing period of women (a period which varies among the different races), and social and economic conditions generally, all have their effect upon the birth rate.

The relation between the birth and death rate is not easily definable. It is often said that a high birth rate means a high death rate. This is in a measure true, but the statement should not be accepted without qualification. A high birth rate would suggest in many instances a relatively large proportion of foreign or negro population, since these commonly have more children than native whites. Large numbers of children among the foreign and negro population, most of whom are in a lower social and economic stratum than the native whites, might mean, of course, greater difficulty for families to protect themselves against economic stress and a consequent failure of health protection, felt most severely by

children. More children among certain population groups would undoubtedly mean some more deaths. On the other hand, if a high birth rate were of long duration, there would be an increase of the population denominator of the death rate, and a consequent lower general rate. Furthermore, there would be, after a time, an increase of that part of the population in the health favorable age periods between childhood and old age. If the high birth rate continued for a few years only, it might result in an increased death rate fifty or sixty years later, when there would be naturally larger numbers of people in the later periods of life and consequently more deaths.

A high birth rate can, however, be considered as indicating the necessity generally of an efficient program of public health service with especial reference to the prevention of infant mortality. Most deaths in infancy are preventable. If preventable deaths of infants are actually prevented, a high birth rate is rather a health asset than a health liability. A high birth rate, however, without an adequate health and welfare program for infants and adults will almost inevitably be accompanied by a high infant death rate.

Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, suggests that the competency of the birth rate to express the facts as to birth registration can be gauged approximately by these three tests.

1. If the number of births registered in a given year is less than the number of living children under one year of age, there is probably deficient registration and the birth rate is therefore lower than it ought to be. Obviously, since many infants die during the first year of life, the number reported as born in a given year should be greater than those alive at the end of the first year, assuming no extraordinary change in the character and composition of the population.

2. If the birth rate shows wide and erratic variations from year to year, deficiencies in reporting are probably the cause, since for the same community these rates are fairly constant from year to year.

3. If the birth rate is below 20 per 1,000 population, or below 25 per 1,000 population in cities with large foreign populations, deficiencies in registration are probably responsible.

The General or "Crude" Death Rate and Its Adjustment

General death rates in American cities may vary from about

8 per 1,000 to 16 per 1,000 population or even higher. This great discrepancy in death rates indicates that apart from the relative efficiency of community efforts to prevent sickness and death, there must be other factors in community life which influence the death rate. There are, indeed, many such factors which are not expressed in the general death rates as reported. It is for this reason that these death rates are called "crude."

Among the more important factors influencing the death rate is the age distribution of population. The mortality curve is like the letter U, the high points of the curve representing deaths in infancy and old age, and the curve of the U, deaths in middle life. The more people of a given community in early adult and middle period of life, the lower will be the crude death rate, other things being equal. So it is that one finds that many industrial cities, whose industries demand workers in early adult life, have crude death rates sometimes very low as compared with other cities not so favored. Likewise, in many of the newer Western cities where the population growth has been largely the result of an influx of younger, more active people in early life, general death rates are likely to be lower than in older cities which offer no call to youth, or from which youth has departed.

Age distribution of population is only one of the many factors which must be considered carefully in comparing general crude death rates. We cannot discuss them all here. Professor George C. Whipple, whose excellent handbook on vital statistics has previously been cited, says: "The general death rate is of little use until it has been analyzed. The 'total solids' in a water analysis give the chemist almost no idea of the quality of the water; it is necessary to separate the 'solids' into their constituent parts. In the same way a death rate must be broken up into its constituent parts." This breaking up of general birth and death rates consists in the determination of a great variety of specific rates in which the various factors of influence, and particularly age distribution of population, are given proper weight.

For the purpose of comparing city death rates, it is, therefore, sometimes desirable that crude death rates be adjusted so that the different age distributions of the populations considered will have their comparable weights.

To make such adjustment of crude death rates, a "standard million" of population is used (usually the "Standard Million" of England and Wales, 1901), the age distribution of which is known,

The expected deaths in each corresponding age group of the cities in question are then calculated as though the distribution of their populations by age were the same as that of the "standard million." A similar procedure is adjusting death rates so that differences in the sex grouping of populations may be properly weighted. For a complete discussion of the procedure of adjusting or standardizing death rates the reader should consult Falk's *Principles of Vital Statistics,* previously cited.

The Infant Mortality Rate as an Index of Health Efficiency

The infant mortality rate is one of the most valuable for purposes of comparing the health status of communities and the efficiency of their public health work because it relates to the mortality of a special age group of the population among which death is largely preventable. If the public health service of the community is efficient in all respects it can ordinarily prevent fully half of the deaths of infants in the first year of life.

The deaths of infants under one year as reported by American cities having satisfactory birth and death registration vary from about 40 per 1,000 births to about 150 per 1,000 births. The lowest rates are most commonly found in cities where public health services for the protection of mother and infant have been highly developed and where other conditions of family life and environment are favorable to health. The highest rates are in the industrial cities where standards of living among workers are relatively low and among the cities of the South, particularly, which have large negro populations. The mere size of the city apparently has little to do with the matter except that children in small communities are more likely to have greater opportunity to take advantage of natural health resources. The largest city of the country, New York, which might be expected to have a high infant mortality rate, has a comparatively low one because of the thorough-going health protective measures which are being carried out by the city government and by private health agencies. On the other hand, Charleston, South Carolina, with only about 70,000 population, and with many natural health advantages, has an infant mortality rate about twice that of New York City. But about half of Charleston's population are negroes whose social and economic state is not conducive to health, and the city has for many years had no public health organization worthy of the name.

In determining the infant mortality rate care must be taken, first, to see that all stillbirths are properly excluded from the totals of both births and deaths, and second, to make sure that the total of births recorded represents with reasonable completeness the births which actually occurred. If many births are not reported, the infant mortality rate will not represent actual conditions. Since the rate is based on reported births, the more births reported, the lower the apparent infant mortality rate, other things being equal. Many cities have found that in order to show a considerable reduction in the apparent infant mortality rate, they had only to improve birth reporting.

Attempts to compare public health efficiency in American cities of widely different character are often made on the basis of their infant mortality rates alone, but such comparisons are likely to lead to false judgments. It is fair to say, however, that any city which to-day reports an infant mortality rate consistently over 100 per 1,000 births is not properly organized and equipped for public health service. In fact an infant mortality rate of over 90 may be regarded as presumptive evidence of the lack of community health efficiency, official and unofficial. The problem of preventing infant mortality among southern negro populations is, perhaps, the most serious and most difficult to solve. The relation between economic efficiency and health protection of infants is direct.

The analysis of infant deaths by age of child, age of parents, race, economic conditions, residence, and otherwise, furnishes the health officer with valuable information about the mortality preventive measures to be applied. As an illustration of this point, the accompanying graph of an analysis of infant deaths in Wilmington, Delaware, in 1919, by wards of residence, is of interest.

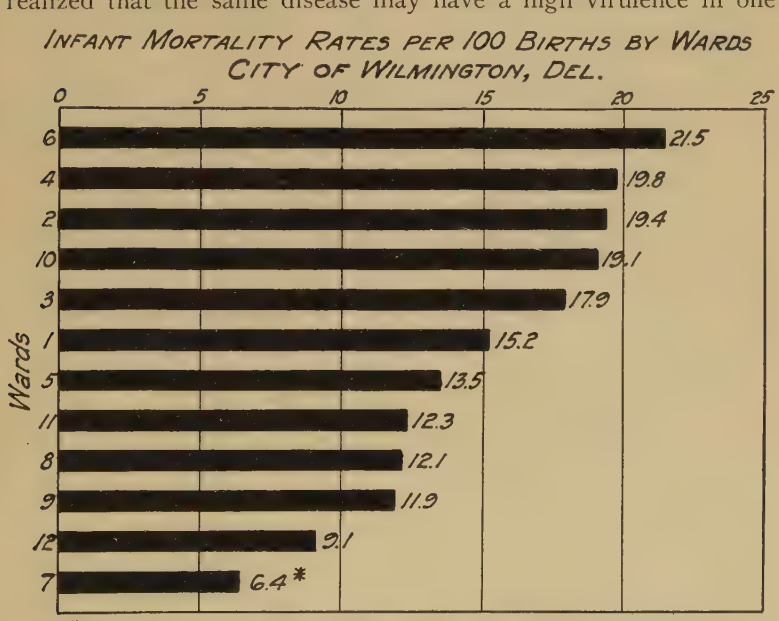
Such analyses of the infant mortality rate are readily made since the standard death certificate furnishes all of the information needed.

Specific Death and Sickness Rates

The death rates and the sickness rates of certain diseases are commonly reported by health authorities. The diseases of chief importance from the public health point of view are the communicable diseases. For the purpose of indicating disease trends and the efficiency of preventive measures, comparisons of death and sickness rates over a long period in the same community are

of some value. Comparisons of annual death and sickness rates of communicable diseases in populations widely separated, operating under different health laws, and otherwise influenced by a great variety of local conditions, are not of great value.

Comparisons of death rates from communicable diseases in different communities are often used, but improperly, in appraising the relative efficiency of their public health services. When it is realized that the same disease may have a high virulence in one



community and a low virulence in another; that one population may be more resistant to certain diseases than another, because of its age distribution or because of its racial composition; that facilities for prompt and efficient treatment of disease may be better in one city than another, it is apparent that attempts to rate the efficiency of their health services by comparisons of rates alone are almost certain to lead to wrong conclusions. Many of the factors contributing to deaths from communicable diseases are wholly beyond the control of the health authority and to attribute such deaths to the inefficiency of health control would be unfair

to the health officers of many communities. Deaths from communicable diseases would normally be reduced, of course, by the reduction of numbers of cases of the disease through efficient health control, but, in many instances, it will be found that a higher mortality from a given disease occurs even in years of decreased incidence of the disease because of special factors not susceptible to health control.

Comparisons of morbidity or sickness rates are of somewhat greater value as indicating the relative efficiency of disease prevention in different years in a given city or in the same year in different cities, but here also it is necessary to use such comparisons guardedly. Since the morbidity rates from communicable diseases are based on the numbers of reported cases, it is apparent that if reporting is deficient, morbidity rates will be correspondingly low. It is probable that even under the most favorable conditions of reporting, the health authority does not have official notice of more than half the numbers of many communicable diseases, such as measles, chickenpox, mumps, whooping cough, etc. Typhoid fever, tuberculosis, smallpox, diphtheria, and scarlet fever are much better reported because these diseases are regarded by the public as more dangerous. The morbidity rates do, however, furnish the health officer with much better information regarding present and probable future health conditions in his community than the death rates. If the morbidity rates are high even though corresponding death rates are low, the latter should not be regarded as indicating a satisfactory condition of health protection. Every person who suffers an attack of communicable disease, even though he recovers apparent health, is a potential future liability, for the communicable diseases are the forerunners of many diseases, disabilities, and deaths in later life which are officially charged to other causes.

In Grand Rapids, Michigan, the writer found low death rates from most of the communicable diseases, but analysis of the sickness or morbidity rates of these diseases showed a condition not as favorable as the death rate alone indicated. Quoting from the report on the Grand Rapids situation:

> Comparison of the morbidity rates and death rates of measles in the period 1911-1922 inclusive shows clearly that the death rate alone of this disease does not present an adequate picture of it. With respect to the death rate, it is noticeable that although the number

of reported cases was greater in the 1920 epidemic than in the epidemic of 1917, there were fewer deaths in the former than in the latter epidemic. The reduction of the number of deaths is commendable but the credit for such reduction is not due primarily to the activities of the health department, but rather to improved facilities for the care of patients, and other factors over which the health department had relatively little control. The significant thing, in so far as community health is concerned, is not the relatively few deaths from measles, but that about every fourth year Grand Rapids suffers a severe epidemic of measles that leaves in its wake a large number of children with marked impairment of health. The large numbers of deaths from pneumonia in varied form among children in the measles epidemic years is in all probability the direct result, in many cases, of primary measles infections. Perhaps it is not an unfair assumption that the increase in reported cases of tuberculosis since 1913 is partly due to the impairment of pulmonary tissue so common in measles.

In the twelve-year period under discussion, the average number of cases of measles reported yearly was 1,200, the average deaths 5. Obviously, the criterion of the health efficiency of Grand Rapids with respect to measles control is not the death rate of this disease but rather the tremendous loss of vitality resulting from this large number of cases. And when it is considered that probably not more than half of the actual cases are reported, the measles menace to health is readily appreciated. . . .

If we examine the course of scarlet fever in the period 1911-1922, much the same situation is revealed as regards the relative significance of death and morbidity rates. This is another serious disease, the health damage of which cannot be measured by its death rate. Scarlet fever is the forerunner of many serious diseases of youth and adult life, organic heart disease, diseases of the central and peripheral nervous system, middle ear disease, mastoiditis, diseases of the bones and joints, and many others. If one considers the death rate alone, he is struck immediately with an apparently greatly improved condition of community health since 1913 and 1914 when there were many more deaths from scarlet fever than in subsequent years. But it will be seen from the curve of rates of reported cases than in spite of the relatively fewer deaths from scarlet fever, there has been about every fourth year since 1913 a high incidence of scarlet fever, that of 1916 apparently reaching the highest point as to numbers of reported cases. The word "apparently" is used because it must be remembered that an increase in the morbidity rate may be due in part to better reporting by physicians.

During the entire period 1911-1922, there were 3,385 reported cases of scarlet fever and 65 deaths according to health department figures,

an average of 282 cases and 5 deaths each year. This is not a serious death toll, perhaps; nevertheless there is ample evidence here to demonstrate the truth, so oft repeated, that the death rate from scarlet fever or other communicable disease does not tell the whole story.[7]

In calculating the morbidity or sickness rates from certain of the communicable diseases, it is noted that several of them have a tendency toward recurrence at intervals of several years. The intervals between the periods of high incidence are fairly constant in length for the same disease in the same city, but may differ for that disease in different cities. Plotting the curve of morbidity rates of the various communicable diseases over a long period in a given city gives the health officer valuable information regarding probable future years of high incidence. He is thus enabled to put the community on its guard and to direct the work of his organization to greater advantage.

In the Grand Rapids study just cited, diphtheria showed, during a twelve-year period, markedly increased incidence every fourth year. Measles, scarlet fever, and whooping cough showed a similar periodicity, the years of high incidence of each of these diseases being practically the same as in the case of diphtheria, although the peak of incidence for each disease did not fall at the same season. There is undoubtedly a close and intimate relationship between the factors responsible for high incidence of these communicable diseases, although their causative bacteria are quite different. All are, however, spread directly from one person to another in the secretions of the mouth, nose, and throat, and in many cases one of these diseases is immediately preceded, accompanied, or followed by another.

Fatality Rates and Their Uses

The fatality rate is merely the ratio between deaths and reported cases of a given disease. It is expressed as deaths per 100 cases or per cent fatality. It is apparent that the accuracy of such rates in indicating disease fatality will depend upon the completeness with which the diseases are reported to the health authority. We have previously indicated that the reporting of communicable diseases is notoriously inefficient; hence, fatality rates for many diseases are correspondingly incompetent to portray the truth.

[7] New York Bureau of Municipal Research, *Report on Grand Rapids Health and Hospital Survey*, 1923 (typewritten), pp. 33-35, 37.

Besides differences which may occur in the same city and in different cities, with respect to the completeness of notification of communicable diseases, there is a great variety of factors influencing the fatality of communicable diseases, whose weights are not easily determined. The source, virulence, and dosage of infection, the susceptibility of the population, the adequacy and availability of facilities for treatment, climatic and seasonal conditions, differences in age, sex, occupation, race, etc., of person attacked—all have a bearing upon the fatality rate. Comparisons of fatality rates in cities showing wide differences in character and composition of population, environment, employment, and economic conditions are, therefore, of little value. Comparison of fatality rates of the same disease in the same community and under much the same general conditions of community life is chiefly useful in suggesting possible fields of health inquiry.

To illustrate this point let us assume that there were 100 cases of typhoid fever reported to the health authority and 20 deaths. Ordinarily, one expects a fatality of about 10 per cent in typhoid fever. If then the fatality rate was 20, or 20 per cent of reported cases, the health officer would be warranted in first suspecting that there were many cases which had not been reported. If reporting was found to be good, the high fatality might suggest to the health officer that many of the patients were not getting the right kind of treatment and he would naturally make an investigation to determine how treatment could be improved. Other investigations suggested by the high fatality would doubtless be made in connection with the routine supervision of cases. The health officer might find that many typhoid patients died because they had received an overwhelming dose of infection or because the disease had attacked a particular vulnerable group of the population. His investigation of these matters would determine official action in prevention of further spread of the disease, and the character of the treatment to be given patients. The same procedure should be followed for other diseases.

We may, therefore, regard fatality rates, when applied to communicable diseases generally, as merely one of many indices of community health efficiency, useful only when considered in connection with a great many other facts about community sickness and death. They are of greater value when used to compare different methods or different periods of treatment of disease in hospitals. In the hospitals, particularly the municipal hospitals for

communicable diseases, the factors influencing fatality, other than the adequacy of medical care and treatment, are of much less significance. A very considerable increase in the fatality rate of a given disease in hospital practice would be suggestive of lower standards of hospital care or a failure to provide hospital care in good season.

Organization for Vital Statistics Work

The type of organization of the vital statistics unit of the health department or bureau depends largely upon the size of the population served, since size of population determines the volume of work required. In small communities of 50,000 population or less, the health officer, himself, usually acts as registrar of vital statistics with possibly one or two clerical assistants. In larger cities, it is desirable that the health officer delegate responsibility for registration to a full time or part time registrar with such additional clerical service as may be needed. Where full time service is required of a registrar who has no other duties to perform, there will be needed on the average one clerical assistant for each 100,000 population.

The chief reason why the vital statistics work of health departments has not been of greater value in determining the health program is that it has been too often regarded as a routine business for which almost any good clerk was qualified. The salaries offered vital statistics registrars and other employees reflect this point of view. The registration of vital facts is, however, not of great practical value to the health officer, until these facts have been so arranged and related to health problems that their significance in sickness prevention is fully disclosed. For such work the average untrained clerk is not qualified. The vital statistician must not only be thoroughly acquainted with statistical methods, but he must also be competent to appreciate their public health uses. The vital statistician stands in the same relation to the health enterprise as the business statistician to the business enterprise. The business statistician determines the direction in which business should be developed in order to conserve capital and produce profit commensurate with expenditure. He points out where losses have occurred and indicates thereby what should be done to prevent them in the future, and he predicts from past experience what will probably occur in the future. He is, in fact, for business exactly what the vital statistician should be for the

municipal health enterprise, but rarely is, namely, the pathfinder of administration.

Whether or not the volume of vital statistics work requires the establishment of a special vital statistics bureau or division of the health service, it is essential that the health authority make ample provision in his budget for the necessary personnel and equipment. The average expenditure for vital statistics purposes in the majority of American cities of 100,000 population or over, is about 3 per cent of the total budget. We cannot, of course, say that it should invariably be more or less in any city for much depends upon the local situation, but it is safe to say that vital statistics work, if competently done, will require approximately 5 per cent of the total health budget for the "strictly defined health activities" of disease prevention. If efficiency in vital statistics registration and research is to be attained, it can only be brought about through the employment by health departments of thoroughly trained vital statisticians, and this means offering salaries sufficient to attract those so trained.

Taking the city of 100,000 population as our standard, there should be a bureau or division of vital statistics under the direction of a full time registrar of vital statistics with at least one skilled clerical assistant. It would be necessary to pay the director of the bureau or division at least $2,500 to $3,000 and his assistant $1,500 to $1,800. From $500 to $600 would doubtless be necessary to provide supplies and equipment. In larger or smaller cities the cost would be greater or less in proportion to the volume of work and the consequent increased personnel and maintenance requirement. Generally speaking, part time service on the part of registrars of vital statistics and their assistants is unsatisfactory except in cities under 100,000 population, where much of the necessary work can be done by the health officer himself. Where part time service is practicable, costs can, naturally, be reduced.

The vital statistics force should, if possible, be provided with quarters separate from those of other units of the health organization, but so arranged that they are of convenient access both to the public, and to other branches of the health organization. The routine business of registration requires that physicians, undertakers, parents, school children, and citizens generally shall have direct contact with registration clerks. The most satisfactory arrangement of quarters for the vital statistics force, is an outer office for contact with the public and an inner office where routine

and special statistical analyses and compilations can be made by the registrar and his assistants with the least possible disturbance.

The equipment of the vital statistics office will be governed largely by the volume of work to be done. The minimum equipment desirable includes the following:

1. Fire proof cabinet or vault for the safe keeping of records.
2. File cabinets for card indices of reference to records.
3. Calculating machine for preparing statistical summaries.
4. Typewriter for use in copying records, so as to avoid illegibility.
5. Telephone with visible indices of names, addresses, and telephone numbers of physicians, midwives, undertakers, and others to whom frequent reference must be made.
6. Record book containing the signatures of physicians, midwives, and undertakers in order that their signatures upon the original certificates may be verified.
7. Complete file of the reports of the United States Bureau of the Census on population, birth, mortality, and morbidity.
8. Good working library of standard volumes on statistical theory and practice.
9. Large clear print map of the vital statistics registration district for "spotting" births, infant deaths, and deaths from notifiable diseases.

In the largest cities where the work required in routine copying of records and the preparation of certified copies is considerable, equipment for photographing records is desirable. The greater the volume of work required of statistical clerks, the greater the need for providing checks against copying errors. Also in such large cities, the use of the Hollerith machine or other comparable device for sorting records and tabulating their significant facts saves a great deal of time, labor and money.

CHAPTER IX

PREVENTION AND CONTROL OF DISEASE

The prevention and control of diseases "dangerous to public health" is primarily a responsibility of state governments, except when interstate relations are involved. In the latter case the federal government is empowered to determine within certain limits what procedures shall be carried out by the state authorities concerned. The federal government is, however, reluctant to interfere with state control except in epidemics which spread rapidly from state to state, such as the great epidemic of influenza in 1918-1919. In view of the independent exercise of authority by the various states and the varying conditions influencing the incidence and spread of disease, the laws governing the action of municipal authorities for controlling disease differ materially in the various states, both with respect to the diseases over which local health authorities are required to exercise supervision and the measures of control authorized.

It is apparent, however, that without reasonable uniformity of state laws and local enforcement measures, prevention and control of the communicable diseases are seriously hampered. Furthermore, without the adoption of standards of disease reporting, comparable facts about sickness (morbidity) cannot be made available for statistical uses. In order to bring about uniformity of disease registration, a conference in 1913 of state and territorial health authorities and representatives of the United States Public Health Service prepared a "model law" for the reporting of diseases and recommended the adoption of the law by the various states with such modifications as might be warranted by local conditions. This model law provides for the establishment of a standard list of "notifiable" diseases and for the procedure of reporting them to public health officials. The model law has not as yet been adopted by all states, but the methods which it embodies have been made the basis of reporting procedure in the majority.[1]

[1] *Model State Law for Morbidity Reports*, adopted by Eleventh Annual Conference of State and Territorial Health Authorities with the United States Public Health Service, June 16, 1913.

The next important step toward uniformity of procedure was taken in 1916, when a committee of the American Public Health Association formulated a body of standard regulations for the control of communicable diseases. Although the adoption of these regulations generally by state and local health authorities would undoubtedly result in more efficient disease control, they are not as yet in general use throughout the country. It is probable, however, that within the next ten years the basic methods of control of communicable diseases as laid down in these proposed regulations will be accepted by the great majority of states and cities.[2]

A further step toward the development of uniform standards of control procedure was taken in 1921, when a special committee of the American Public Health Association drafted a model health code for cities which covers generally the requirements of a good local ordinance for communicable disease control. The adoption of this code is, however, contingent upon the authority in this respect which may be granted local legislative bodies by their respective states.[3]

The Notifiable Diseases

Though somewhat differently classified in the model law the diseases which are to be reported to health authorities, *i.e.*, the so-called "notifiable" diseases, include three well-defined groups which, for our purposes, will be designated as follows:

1. *Communicable diseases,* or those which are transmitted from man to man, and from animals to man directly or indirectly by a specific virus or infective agent, such as measles, scarlet fever, diphtheria, typhoid fever, rabies, malaria, syphilis, etc. Certain of these communicable diseases such as measles, scarlet fever, diphtheria, mumps, whooping cough, etc., are commonly referred to as "contagious" diseases because they are spread ordinarily through the more or less direct *contact* of persons.

2. *Occupational diseases,* or those which are due to the action upon the human body of various poisons or harmful agents found in certain places and conditions of employment, or produced in a number of industrial processes. Such diseases are lead poisoning,

[2] American Public Health Association, *Control of Communicable Diseases* Report of the American Public Health Association on Standard Regulations, Reprint No. 1129 from Public Health Reports, 1926.

[3] American Public Health Association, *Model Health Code for Cities.* Report of the Committee on Model Health Legislation of the American Public Health Association, March, 1921.

arsenic poisoning, mercury poisoning, carbon monoxide poisoning, caisson disease (compressed air illness), and many others.

3. *Diseases of unknown origin,* or those such as cancer and pellagra, of which notification is desired in order that their incidence and the factors influencing their incidence may be more thoroughly studied.

The important thing to note about the diseases represented in these three groups is that all are in theory preventable or reducible. Communicable diseases can be prevented by stopping all channels of communication between the infected person or animal and other persons or animals. Occupational diseases can be prevented by guaranteeing the worker protection against gases, dusts, and other harmful agents, through the enforcement of sanitation in factories and workshops, and education of workmen in personal hygiene. For the prevention of cancer, pellagra, and many other diseases whose specific causes are not as yet clearly defined, we must, however, depend almost wholly upon the education of the public in personal hygiene and right living.

It is with the two first named groups of diseases, namely, the communicable diseases, including the so-called contagious diseases, and the occupational diseases, that health authorities are chiefly concerned. These diseases are preventable or controllable because their causative agents and modes of transmission are known and because it is possible to establish and enforce restrictive legal meaures against them. Diseases such as cancer and pellagra are not as yet subject to control by legal measures because we do not know enough about them and cannot, therefore, define satisfactory bases for legal action.

Difficulties of Control of Communicable Diseases

If all creatures having diseases communicable to man could be found and isolated from all possible contact with other creatures, directly or indirectly, it would be quite possible to eradicate these diseases completely. Eventually under such a system of control the organisms responsible for the diseases would be completely destroyed, and once destroyed no more could be produced. The practical impossibility of any such control is obvious. First, there are many persons having disease in a communicable form, but without apparent or visible evidence of it. Such persons, called "carriers," harbor disease germs in their bodies, often without having themselves any disease symptoms whatever, but once the

germs are passed on to others the disease in all its manifestations may appear in the newly infected persons. The typhoid carrier may carry typhoid bacilli in his intestinal tract for many years unknown to himself or to others, and may transmit the disease to many people by contaminating the food or water used by them. There are many instances of typhoid epidemics traceable to "carriers." The same is true of "carriers" of diphtheria and probably of many other diseases.

Then, too, there are many mild cases of disease which are not seen or at least not recognized by any one responsible for reporting them to health officials. From such evidence as is available it is estimated by competent sanitarians that less than half of the cases of communicable disease are reported to health officials. Responsibility for this situation rests in part on the doctors of the community, who are charged with reporting those observed by them, but even if all cases observed by them were promptly reported, there would still remain a great number of "missed" cases. An extremely mild case of smallpox, for example, may experience only slight malaise and may show on his skin perhaps only a single "pock" which escapes the notice of any one. He may, however, promptly transmit the disease to another in whom the virus will find fertile soil and produce the disease in its most fatal form.

Still another practical difficulty in the way of complete control of communicable diseases, is that many of the readily communicable diseases are most easily transmitted during the early period of disease before characteristic signs and symptoms have appeared and before, therefore, any attempt has been made to limit the contact of the patient with others. The identifying sign of measles, for example, is a "rash" or eruption on the skin or on the mucous membrane of the mouth, and this rash may not appear for several days after the onset of the disease. Before the rash appears, however, the patient may have all the symptoms of a common cold with coughing and sneezing. It is during this coughing and sneezing period that the disease is most readily spread by the infected secretions of the mouth and nose and yet during this time the patient may be thought to be coming down with a simple cold, and hence no precautions may be taken either by him or his associates. So it often happens that by the time a case of measles is recognized by its characteristic rash and reported to the health authorities, the infection has been widely spread. Efficient control of measles is on this account a very difficult thing in thickly

populated areas. The same is true of several other diseases which are not readily identified until some time after their onset.

Of the various communicable diseases there are only a few, chiefly smallpox and ophthalmia neonatorum (gonorrheal infection of the eyes of new-born infants), against which the states have enacted laws requiring compulsory protection of the individual. Smallpox can be absolutely prevented by vaccination of all persons and some states require compulsory vaccination of all children prior to school entrance. Where there is also a compulsory education law and a compulsory vaccination law, few children are likely to escape vaccination, and smallpox is rarely seen except among unvaccinated adults. But not all states have such laws, and in many states vaccination is compulsory only when there is evidence to warrant belief that an epidemic is pending or in course. Ophthalmia neonatorum can be prevented by strict enforcement of a law requiring the prompt treatment of the eyes of all new-born infants immediately after birth. Many states require physicians and other attendants at birth to do this, but it is obviously difficult to enforce the law in all cases.

There are several other diseases, notably diphtheria and typhoid fever, against which there are now available methods of immunization which would completely eliminate these diseases if they could be universally applied. But as yet no state has required compulsory immunization against typhoid or diphtheria. Recent studies have indicated that we will soon have effective means of immunizing people against scarlet fever and measles, and it is within reason to expect that during the next decade means of immunization against many other communicable diseases will be found. But public health laws do not keep step with the advancement of scientific knowledge about disease prevention. It will probably be a great many years before we will have laws which will require compulsory immunization against diphtheria, an absolutely preventable disease, that destroys thousands of people yearly. Typhoid fever has been almost eliminated in many communities by the improvement of water and milk supplies and other sanitary measures, and such improvements in municipal sanitation may suffice to eradicate the disease in some places without compulsory immunization. Probably the reason why vaccination is now compulsory in many states, more than a century and a quarter after Dr. Edward Jenner demonstrated its efficacy as a preventive of smallpox, is that the disease disfigures the faces of its victims. If typhoid fever, diph-

theria, and other diseases produced similar facial disfigurement, there would be greater public demand for protection against them, and better support for compulsory preventive measures.

Briefly summarized, the chief difficulties in preventing and controlling communicable disease are: (1) the presence in every community of unrecognized disease carriers; (2) large numbers of mild cases, "missed" because not observed or identified by those responsible for reporting them to health officials; (3) the rapid communicability of many diseases at their very inception and before characteristic signs and symptoms have developed; (4) the fact that public health laws do not keep pace with scientific research in disease prevention.

Outline of Procedure of Control of Communicable Diseases:

Conceding the many difficulties that beset a health officer in his campaign against disease, there are, however, certain well recognized measures of control which, if carried out to the limit of his legal authority and opportunity, will certainly do much to protect a community from serious disease losses. These are:

1. *Registration of Disease.* The enforcement of the law requiring reporting of disease by physicians and others, and the encouragement of reports of suspected cases by citizens generally.

2. *Identification of the Disease.* Verification of the diagnosis of the disease by physical examination of the patient and laboratory tests when necessary.

3. *Isolation and Supervision of the Patient.* The separation of the patient, when necessary, from contact with other persons and his supervision in such places and under such conditions as will prevent communication of the disease to others.

4. *Quarantine of Exposed Persons.* The restriction and supervision, when necessary, of the movement and contacts of persons exposed to the disease, for a period of time depending on the nature of the disease, and until their freedom from infection has been established.

5. *Immunization of Exposed Persons.* The prompt immunization of exposed susceptible persons if the disease is one against which immunization is available and advisable, particularly diphtheria, smallpox, typhoid fever, and scarlet fever.

6. *Investigation of Sources and Modes of Infection.* An inquiry as to contacts of patients with previous cases to determine and control the source of disease, including the investigation of

milk and water supplies, sewage disposal, soil pollution, overcrowding in public places, and other conditions favoring transmission of disease, and the establishment of general community protection as indicated.

7. *Release of Patient from Control.* Formal release of control of patient on termination of disease as demonstrated by physical examination and laboratory tests.

8. *Renovation of Premises.* Cleansing of the patient's person and of premises occupied by the patient, sterilization of bedding, clothing, etc.

As previously noted these procedures are generally applicable to all diseases of the communicable type. Depending on the nature of the disease, however, certain modifications of procedure are indicated. The specific application of these general procedures to each of the various communicable diseases is set forth in the standard regulations recommended by the American Public Health Association previously mentioned.

Prompt and Complete Registration of Disease Essential to Control

The importance of adequate registration of all notifiable diseases is indicated by its position in the foregoing outline of control procedure. Obviously, nothing can be done officially to control a case of communicable disease until the health authority is informed of its existence and location. As already stated, the difficulties of securing complete registration of all cases of notifiable diseases are many, and in consequence, reporting is everywhere incomplete.

The "model law" regarding morbidity reports, which we may take as the basis of reporting procedure in the majority of states and cities, requires that the physician who treats or examines any person having a notifiable disease named in the law shall report the fact "immediately" to the local health authority. The model law further requires that the report shall be forwarded by mail or special messenger and shall give the following information: (1) date when report is made; (2) name of the disease or suspected disease; (3) name, age, sex, color, occupation, address, and school attended or place of employment of patient; (4) number of adults and children in the household; (5) source or probable source of infection, or origin or probable origin of disease; (6) name and address of reporting physician. Nurses, midwives, attendants, and "other persons" in charge of the patient are also required to notify

the health authority of suspected cases, if no physician is in attendance.

The most important thing in registration of diseases, particularly the communicable diseases, apart from a clear definition of the disease for which notification is required, is the provision that notification shall be "immediate." In the writer's judgment any notification law should define exactly what is meant by "immediate" notification. It is better to fix the period as "within six hours" or "within twelve hours" in order that there may be no differences of opinion on this point. The efficiency of control of communicable diseases depends not alone upon the completeness, but upon the promptness of notification. Where the time limit for reporting is definitely fixed deficient reporting is less evident and control measures can be more effectively applied. The model health code for cities suggested that all communicable diseases be reported within six hours. In some cities one still finds laws regarding notification of disease very weak in this respect. Physicians may be allowed several days in which to report, or the law may declare that reports shall be made "immediately on diagnosis" of the disease. It is apparent that such interpretation of the physician's responsibility does not meet the requirement of prompt reporting. The physician may suspect that the disease is a communicable disease but he may not be able to make a positive diagnosis within several days. This might mean, in some instances, a dangerous delay in the establishment of control measures by the health authority. It is better, therefore, to follow the model law on this point which says that the physician shall report immediately any person "afflicted with or *suspected to be* suffering from or afflicted with any of the notifiable diseases."

Another feature of any good law regarding morbidity reports is the requirement that reports of physicians shall be made in writing. This is necessary to put the physician on record. To encourage prompt reporting, physicians should be permitted to give immediate notification by telephone, but the written report should follow in all cases. Where telephone reports only are required, it often happens that the question whether or not a physician reported a case of disease becomes merely one of the veracity of the physician or the health employee who received the report. The written reports should be made upon blank forms, uniform as to size and character of information required. Post cards are sometimes used for this purpose, but many health authorities regard this method

as unsatisfactory because it does not permit the maintenance of confidential relations between the physician and patient. Reporting tuberculosis, or venereal diseases particularly, by post card is objected to on this ground.

When the physician sends a specimen to the health laboratory for diagnosis, as in the case of typhoid fever, diphtheria, tuberculosis, or venereal disease, the receipt of such specimen, if accompanied by the necessary information regarding the patient, should be accepted as compliance with the notification law.

The Responsibility of the Physician

Although, as we have said, physicians are in part responsible for incomplete reporting of diseases, they have often been as much sinned against as sinning in this respect. They have been asked to make reports of many diseases which, after made, are unused by health authorities, except for statistical purposes. Naturally physicians regard it as of no purpose to prepare detailed reports which are simply buried in the official files or statistical summaries. They have also been called upon to furnish a great deal of miscellaneous information about their patients and their families, their environment, social and economic conditions, etc., which, though they may be properly subjects of official inquiry, are not necessarily matters for inquiry and report by the private physician. The constant complaint of doctors is that they are beset on all sides for records and reports about their private patients which take much of their time and result in little benefit to patients. There is some justification for such complaints and unless the regulations governing reporting procedure are so designed as not to impose undue burdens on physicians, their coöperation is not likely to be as good as it ought to be.

Many health authorities hold, therefore, that it is unwise to require physicians to make such detailed written reports as are called for in the model law. They say that physicians should not be asked to make an investigation of the circumstances of disease other than those necessary for its diagnosis and registration with the health authority. It is argued that the source of the disease, contacts of the patient with others, and other information desired for the establishment of control procedure should be made by representatives of the health authority and not by the private physician. This is the view taken by the framers of the model health code for cities, to which previous reference has been made.

According to this code the physician is required to report only the name of the sick person; the name of the disease; name, age, sex, race, and exact address of the patient; exact occupation and place of employment or school attended; name and address of person making the report; date of report. In the model health code for cities also, reports are required only for those diseases for which definite control procedures are to be carried out by the health authority—state or local.

Aids to Better Disease Registration

Whether or not the model law is adopted, the essentials of any plan for securing good registration of disease are these:

1. The health authority should provide adequate laboratory facilities for the use of physicians in making diagnosis of disease.
2. The law should be explicit as to the diseases to be reported and the responsibilities of physicians and others in the matter as to time of reporting and the information to be reported.
3. All physicians should be furnished with copies of the law and full information of the procedure for which they are to be held responsible.
4. The law should be enforced with due regard to the public health need and the exigencies of private medical practice.
5. A thoroughgoing campaign of public education should be carried on regarding the necessity of prompt and complete registration of the notifiable diseases.

In the improvement of registration of disease, the health laboratory plays a most important rôle. If the physicians of the community are offered good laboratory facilities for the diagnosis of communicable diseases and every opportunity is given them to utilize the laboratory both for diagnosis and treatment of disease, registration of many of the communicable diseases may be secured as the result of the examination of specimens sent in by the physicians. Positive diagnosis of diphtheria, typhoid fever, venereal disease, malaria, hookworm disease, erysipelas, rabies, tuberculosis, and many other diseases due to a known specific organism can frequently be made only by the laboratory. As already noted, a specimen from a patient having any such disease, when sent to the laboratory for examination, should be accepted as a report of such disease if the necessary information for registration accompanies the specimen.

Another procedure which has been found helpful by many health

officers in improving the registration of notifiable disease is the checking of all deaths from these diseases against the register of reported cases. When a physician sends in a report of a death from one of the notifiable diseases, there should be a record of the registration of that disease prior to the patient's death, if a physician were in attendance during the patient's illness. If no record of an original report of the patient's illness is found, the attending physician should, of course, be called to account. The current maintenance of such a check upon reporting disease will serve to indicate to the health authority, who among the physicians are responsible for failure to report, and repeated negligence in the matter should call for the penalty which the law provides.

As we have previously said, good registration of disease cannot be secured by law enforcement alone. The success of the health officer's effort to improve registration will depend rather upon efforts to encourage the voluntary coöperation of physicians and the general public in the matter. In many instances the failure of physicians to report disease is due to the attitude taken by the patient or members of the family who fear the interference of public authorities. If the public attitude toward such necessary interference can be changed, the efficiency of disease registration will be greatly improved. This means not only a well organized health educational campaign, but a scientific common sense application of control procedure to the circumstances of the patient and his family, so that they will not be subjected to annoyance by unduly rigid isolation or quarantine measures.

No one prefers sickness to health, and the efficiency of community health service to-day depends upon keeping the public fully informed about the things which prevent sickness and promote health. There was a time when health officers considered it their duty to keep the public in ignorance about the presence of disease in their communities. They feared to "alarm" the public and they feared the criticism of business men that the publication of facts about disease would "hurt business." But the modern health officer has found it wiser to tell the public the whole truth and sensible business men know that business is more often hurt by concealment of the facts about disease than by bringing them to view so that protective measures can be intelligently carried out.

Other Important Phases of Disease Registration

Assuming that the health authority has received a report of the

disease from a physician or other person, and the diagnosis of the physician has been confirmed by laboratory test or otherwise, the next immediate step is the establishment of the necessary control measures with reference to the patient, his family, and their associates. But when this has been done further inquiry must be made about the disease and its origin in order that registration may be complete, and the further action of the health authority for community protection determined.

Every case of communicable disease means that there has been a previous case of that disease. The infection may have been conveyed directly to the patient by close personal contact with the previously infected person. It may have resulted from the indirect contact of the patient with the previously infected person through the medium of contaminated milk, meat, water, or other food or beverage. It may have been due to the bite of an insect or other animal carrier of disease which had received the infectious organism from a previously infected person or animal. Unless the source of the infection is already established and under control, it is the duty of the health officer to make a thorough inquiry of all possible sources and to record the facts discovered. Registration of typhoid fever, for example, is by no means complete until it has been determined, as far as can be, from what source the patient received his infection. The control of a disease so readily spread by contaminated milk or water requires the most searching inquiry as to the cleanliness of these supplies. It is well-nigh impossible in many instances to locate definitely the source of infection in measles, diphtheria, scarlet fever, smallpox, and other contagions spread by direct contact of persons, but careful investigation will often bring to light the existence of a previous unreported case of disease.

It is at this point in the registration of disease that one notes the most significant defects in municipal health department procedure. It is customary for many health officers to consider registration complete when the physician has made his report. This may do well enough for certain minor infections conveyed by direct contact, but it is certainly not adequate for the protection of the community against many of the serious diseases whose mode of attack is more roundabout and less readily guarded against by the individual. The following citation from a report on the procedure of the Wilmington, Delaware, health department illustrates a not unusual situation:

The fact that there were 150 or more cases of typhoid fever in Wilmington in 1917 with 30 deaths should be cause for serious thought on the part of the health authorities. It is stated by one of the physician members of the present board of health that many of these cases come to Wilmington from other places and that it is unfair to charge them against Wilmington. To verify this statement the investigator examined the records of typhoid fever cases in 1917. Unfortunately, however, the only conclusion that could be reached was that the records were useless. In the first place, the card record file of typhoid fever cases showed only 79 cards, although 150 cases were registered according to the report of the board of health for 1917. These cards were all incompletely filled out, and the required information was not supplied in a single instance. (This statement is true also of other card records of communicable diseases.)

One of the most important items on the card is the question regarding the milk supply of the patient. In a city with good water supply, milk is one of the most common media for the transmission of typhoid fever. Milk is an excellent medium for the growth of the typhoid bacillus and given such an inadequate control of the milk supply as in Wilmington, milk may be counted upon to do its full share in the transmission of this disease. Yet in the majority of cases the milk supply was not stated on the record card so that even if the health department had desired to trace out all possible sources of the typhoid epidemic of 1917, it could not have done so. And yet the health department report for 1917 says that the "sources" of the disease were found and eliminated.

As far as the records show there was no investigation of sources of typhoid fever worthy of the name. A good water supply has lowered Wilmington's typhoid rate considerably in the past decade, but it can and should be made still lower by the adoption of more aggressive tactics on the part of the health authorities. First comes proper reporting of all cases and to this end an adequate laboratory service is essential for the examination of specimens of blood from supposed cases. Next is a thorough investigation of each case and a proper record of the case by a trained observer, preferably a physician-epidemiologist. The facts which the investigator will discover will indicate the steps to be taken to prevent further infection.

It is recommended, as a preliminary step in tracing the source of typhoid fever, that a chart be kept in the health office which will show the various milk dealers and the number of reported cases of typhoid fever which received milk from each of the various supplies. If this chart is kept currently to date, any increase of cases on the route of a given dairyman will point to the possible source of infection and thorough investigation may develop that contamination of the milk is occurring somewhere on the line between the milk pro-

ducer and the consumer. Typhoid carriers are often responsible for the contamination of an entire milk supply and the infection of scores of people. In one serious epidemic of typhoid fever in New York City it was established beyond a doubt that a typhoid fever carrier who was a milk dealer was responsible for the epidemic, although this carrier had had typhoid fever many years before the outbreak. In Wilmington, in 1917, the very character of the sharp outbreak of typhoid fever indicates the probability of a milk-borne infection.[4]

In recording the facts about disease and the source of infection, no information should be recorded unless it is pertinent to prevention and control, but none that is needed should be omitted. In Norfolk, Virginia, for example, where typhoid fever prevention was a most serious concern of the health authority, the records of typhoid fever cases were examined to discover, if possible, the source of the infection, but to no purpose for reasons which appear in the following excerpt:

> Up to September 1, 1915, sixty-eight cases of typhoid fever were reported. All of these cases were investigated by the nurse. In filling out the data regarding the milk supply, however, the question of exactly where the milk came from was improperly answered. In several instances the information was that the milk came from "store nearby," "colored woman," "———'s store," "small store," etc. Such information is, of course, of little value. The card should show where the milk was produced if possible. This is difficult in the case of milk which comes from the large distributing plants which may be supplied by several dairies, but even in such cases it is possible to trace the milk either to one source or several. In each case, a determined effort should be made to find out definitely where the milk came from and how and by whom it was handled from the time of its production to the time of its consumption by the patient.[5]

An investigation to determine the facts about disease which the health authority needs is one requiring exceptional skill on the part of the investigator. He must be thoroughly familiar with the disease itself, its manifestations and treatment, and with the means and modes of its transmission. He must be capable, in other words, of making an epidemiological study of the disease. One reason why registration of the facts about disease is so often

[4] New York Bureau of Municipal Research, *A Survey of the Government of the City of Wilmington, Delaware*, 1919 (typewritten), pp. 330-332.

[5] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Norfolk, Virginia*, 1915 (printed), p. 343.

incomplete is that the persons charged with responsibility for its investigation are not professionally trained for the work. With but few exceptions, investigations of the more important communicable diseases should be made by physicians rather than by nurses or lay inspectors. Nurses and some lay inspectors are competent to investigate disease conditions only when the procedure of investigation can be reduced to a routine, not calling for thorough understanding of preventive medicine.

Essentials of Tuberculosis Prevention and Control

Among the many communicable diseases, there are three which deserve special mention because of their wide prevalence and their importance as causes of death and disability, namely, tuberculosis, venereal disease, and hookworm disease.

Tuberculosis is not a readily communicable disease like diphtheria, measles, or scarlet fever. The evidence of the infection is sometimes very difficult to discover in its early stages; its symptoms are often so obscure at the outset as to cause the patient no alarm and do not incapacitate him in his customary activities; and it is a much more widely prevalent disease than is commonly appreciated by the public. Furthermore, there is a general reluctance on the part of patients, less so now than formerly, to have their illness revealed to their associates. There was a time not so long since when notification of tuberculosis was extremely difficult to secure because of the feeling on the part of patients, and their physicians as well, that the disease somehow stigmatized the patient to his great disadvantage. This feeling has not entirely been done away with and it accounts in part for incompleteness of registration which is further fostered by other characteristics of the disease which have been earlier mentioned.

Registration of cases of tuberculosis is steadily improving, but it is by no means the exception to find that the number of deaths from tuberculosis reported to a municipal health authority during the year actually exceeds the number of cases of disease registered for the same period. When it is realized that at the present time in this country about one out of ten deaths from all causes is due to tuberculosis in some form; that many persons suffer permanent incapacity and death from other diseases for which a precedent tuberculosis infection is responsible; and that for each death from tuberculosis there are probably not less than twelve to fifteen living cases of the disease, the magnitude of the health

problem is apparent, and the need for better registration of the disease a first consideration.

Scientific medical treatment, if given early, can save the lives of many tuberculosis victims, but the problem of preventing its occurrence is the vital one from the public health viewpoint. Prevention of tuberculosis requires first, as we have indicated, good registration of cases in order that those who are sick may be prevented from transmitting their disease to others. It requires also provision for treatment at public expense for many patients in their homes, in hospitals, and in sanatoria. But more than that, it requires health education and health instruction of children and parents for the betterment of their bodily resistance to the disease, the elimination of slums and the many environmental and occupational handicaps to right living, proper diet, and the free use and enjoyment of the natural health aids of fresh air, sunshine, and outdoor life.

Of particular importance in the prevention of tuberculosis are the health examination and supervision of children. It is now held that the great majority of tuberculosis infections occur in childhood, both because of the low natural resistance of children to infections generally, and because of the frequent occurrence of the tubercle bacillus in milk which forms the basis of diet in infancy and early childhood. The importance of clean milk from tuberculosis-free cows is apparent, and efficient regulation of the milk supply is, therefore, a factor in the prevention of the disease which needs to be emphasized.

Any impediment to normal health functioning of the bodies of children lowers resistance to disease and particularly to tuberculosis. The correction of the physical defects of children is clearly a necessary part of tuberculosis prevention. Bad teeth, enlarged tonsils, adenoids, orthopedic defects which inhibit normal physical activity, faulty posture, and many other like conditions of physical impairment, tend to break down the barriers against tuberculosis. Diet is an extremely important fact in increasing bodily resistance of children and its intelligent supervision among underweight, undernourished "pretuberculous" children is a necessary part of the antituberculosis program.

In many cities public health authorities have played a minor rôle in the prevention of this disease. This is because the need of organized effort to check the disease was first recognized by unofficial groups, and because for many years public authorities were

unable to secure sufficient funds to take over the work so well begun by private agencies. The present tendency is toward the recognition of municipal health authorities as the logical leaders and directors of the antituberculosis movement and there has been in the last ten years a great expansion of public health activities in this field. Tuberculosis control should be regarded as a basic public health problem and the necessary measures of control should be provided at public expense and directed by the health officer of the community just as in the case of other communicable diseases. The aid of private agencies will be needed in many instances to meet some of the emergencies which arise in connection with the care of the patient and his family, but the health officer cannot afford to lay aside any of his own direct responsibility for registration and control procedure.

Venereal Disease Prevention To-day's Most Vital Health Problem

The venereal diseases, gonorrhea and syphilis, probably cause more deaths than all other communicable diseases combined, although the cause of death may not be so recorded in the death registers. Many deaths attributed to other diseases are in fact due to previous venereal infections, such as diseases of the brain and spinal cord, heart disease, disease of the kidney, diseases of the bones and joints, etc. Perhaps half of the stillbirths and deaths in early infancy are due to venereal infection of parents. It is impossible to say to what extent venereal infections occur among the general population because even where registration of the disease is required by law relatively few cases are reported to the health authorities, for reasons sufficiently obvious. Estimates of the probable numbers of venereally infected persons range from 10 to 20 per cent of the population. Lacking satisfactory registration of cases these estimates must necessarily be based upon the findings with respect to certain groups of people, as patients in hospitals and other institutions, and members of military and naval forces. Of the 24 million and more men between 18 and 45 who were registered for the draft under the United States Selective Service Act, it is estimated by competent observers that about two and a half million or 10 per cent had venereal infection in some form, and of these approximately half a million, or 2 per cent, were syphilitic. In public hospital practice where the special laboratory tests for syphilis have been applied generally to patients, it has been found that upwards of 10 per cent are

syphilitic, and in hospitals for the insane the proportion is sometimes as high as 20 to 25 per cent of total admissions. In the large centers of population like London, Paris, and New York, public health officials estimate that syphilis exists in from 10 to 15 per cent of the general population. Gonorrhea is several times more prevalent than syphilis and many of the best authorities state that 60 per cent or more of males have gonorrhea at some time, chiefly before the thirtieth year.

The difficulties of control of venereal diseases are at once apparent. As a rule neither gonorrhea nor syphilitic infections compel the patient to take to his bed, at least in the early and most infectious periods of the disease. The characteristic signs and symptoms of the disease may be readily concealed and the infected individual is naturally inclined to keep his troubles to himself. If he is properly treated at once many of the immediately troublesome symptoms may disappear and he may believe himself cured, although he is still quite capable of transmitting his infection to others. The very fact that gonorrhea, particularly, is so common among men, leads the ignorant to regard it as of minor consequence and to neglect treatment at the hands of skilled physicians. Many sufferers from venereal disease become the prey of "quacks" and the purveyors of "cures" of all kinds, to their own great distress and to the increased danger of others.

Requirements of Venereal Disease Control

While the general principles of control of venereal diseases are the same as for other communicable diseases the difficulties of control which have been noted make it necessary to adopt exceptional control reinforcement measures. In brief the special requirements of an effective program of venereal disease prevention and control are these:

1. Adequate state and local legislation which will permit the health authority to require prompt and complete reporting of the disease or suspected cases of it by physicians, and continuing supervision and control of the conduct and contacts of patients to ensure their proper treatment.

2. The provision of facilities in the health laboratory for making laboratory tests of blood, tissues, and other specimens from the bodies of suspected patients to determine the diagnosis of the disease and to indicate the results and necessary duration of treatment.

3. The provision of special facilities for the treatment of venereally infected persons in hospitals and in dispensary clinics at public expense and under the official regulation and control of the health authority when necessary.

4. A continuing program of health education and instruction in personal and public hygiene for children and adults.

With respect to legislation designed to prevent and control venereal diseases, apart from those regulatory enactments which the health authority is called upon to enforce, a great deal might be said. The problem of venereal disease control is largely one of preventing illicit and promiscuous sexual intercourse. To this end there is a great variety of laws, some of them enforceable and partly enforced, others more honored in the breach than in the observance. Nearly every state has enacted legislation prohibiting illicit sexual intercourse, but its enforcement is, of course, a practical impossibility except in a very limited way. Prevention of the marriage of venereally infected persons by requiring applicants for marriage license to submit certificates from physicians that they are free from disease is a thoroughly practicable measure, but one difficult to enforce satisfactorily until all states have similar laws on the subject. The elimination as far as possible of all agencies and institutions which foster illicit and promiscuous sexual intercourse, or contribute otherwise to the abuse of social privileges, is mainly a matter for police attention. Houses of prostitution can be abolished as well as other businesses and practices which promote sexual promiscuity and in consequence venereal disease, but prostitution has always existed particularly in urban centers and probably always will exist. The most successful regulatory measures have failed to do much more than to force it into hiding. The elimination, also, of "quack" venereal disease doctors and fake venereal disease "cures" is possible through the enforcement of laws which will permit only properly qualified physicians to treat the sick, and the punishment of exploiters of fake "cures" as public health nuisances. Besides these various legislative measures which have direct application to the prevention of venereal diseases, there are many laws for the betterment of social and economic conditions which indirectly influence the prevalence of venereal diseases, such as general laws governing marriage and divorce, the employment of women and minors, housing, entertainment and recreation, the regulation of use of alcoholic beverages, narcotic drugs, etc. There is hardly a phase of modern social life

which does not in one way or another have its bearing upon the problem of venereal disease control.

From the health officer's point of view, however, venereal disease is merely a communicable disease and to be so dealt with. It is his duty to promote legislation which will permit him to deal with venereal disease more effectively and to protect the public health from disease otherwise, as best may be, but he is not directly concerned with activities for the promotion of public morality except as they may directly affect the reduction of disease. When the time comes that health officers generally are furnished with the necessary legislation and sufficient funds to prevent and control venereal diseases, and have made use of all that public health science has put at their disposal to this end, it will be time enough for them to consider the question of public morals.

Most states have enacted laws regarding the control of "diseases dangerous to public health," which, though perhaps not giving local health authorities broad enough powers with respect to venereal diseases, could be used more intelligently for the purpose than they are now used by many. In Grand Rapids, Michigan, for instance, in 1923 an excellent venereal disease clinic was conducted by the city physician at the city hall. The state law required reporting of venereal diseases, although at the time of the writer's study the competency of their law was in doubt. Nevertheless, a great deal of valuable information was obtained by the city physician regarding patients in the venereal disease clinic which should have been available for the information of the health officer of the city. The inadequacy of the procedure in this particular city and state to make good use of the opportunities afforded by the law, is illustrated in the following citation:

> Such information as the city physician obtains in the clinic regarding cases of venereal disease is transmitted to the state health authority. For this use a report form is provided by the state health department. This blank calls for all essential information, and is the form recommended by the United States Public Health Service. No complete copy of this record has been kept by the city physician, although when his attention was called to the fact he recognized the importance of having such a copy. The practice of the city physician has been simply to keep a reference card giving the name of the patient, his address, and the date and nature of his treatment.
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> It is of considerable health interest to know the occupations of

these venereal disease patients. The state law prohibits the employment of any person with infectious or venereal disease in cigar manufacturing places and gives the local health authority the right to require such persons to submit to a physical examination to determine whether or not they are so infected. Another law prohibits the employment of any person with infectious or venereal disease in any place where food or drink is prepared, cooked, mixed, baked, exposed, bottled, packed, handled, stored, manufactured, offered for sale, or sold. Since no information as to the occupations of persons registered at the venereal disease clinic could be furnished there, owing to the fact that no complete copies were made of the information previously sent to the state health office, the city physician, on behalf of the investigator, requested the director of the bureau of the state health department responsible for keeping these records to furnish information as to the occupations of venereal disease cases reported to him from Grand Rapids. He replied, "To secure the information you have asked for would necessitate selection of cases from Grand Rapids from approximately 30,000 cases. It is impossible to take time to do this." This is indeed a commentary on the efficiency of the state's service in prevention of disease in Grand Rapids, and an index to the intelligent enforcement of law by public officials. These acts, in so far as they relate to the prevention of venereal disease in Grand Rapids, are a dead letter. It is true that the city physician if he finds a patient with venereal disease prohibits such person from employment where he might transmit the disease to others, but dependence upon such method of eliminating infected persons from the businesses prohibited to them by the health laws cannot guarantee the desired protection to the community.[6]

Recognizing the necessity for giving local health authorities the fullest possible measure of authority over known or suspected cases of venereal disease, many states have reinforced their general laws regarding communicable diseases with special acts relating to venereal disease. A good illustration of the type of legislation needed by all health officers is that provided in the New York state public health law.[7]

The second requirement mentioned as of special importance in venereal disease control is good health laboratory service. Syphilis and gonorrhea are each due to the action of specific microörganisms and their toxins on the tissues of the body. Syphilis is caused

[6] New York Bureau of Municipal Research, *Report on Grand Rapids Health and Hospital Survey*, 1923 (typewritten), pp. 70-71.

[7] New York State Department of Health, *Public Health Manual*, 1924, Art. XVII-B, pp. 68-70.

by the microörganism called *treponema pallidium,* which enters the body in probably more than 90 per cent of cases by way of the genital organs. Gonorrhea is due to the microörganism *diplococcus gonorrhœae* which enters the body in the same way. The acute symptoms of each disease when considered with the history of the patient's sexual contacts are so characteristic generally as to permit diagnosis in many cases without microscopic identification of the microörganism. Positive evidence of the existence of the disease can only be obtained, however, by finding the germ in the tissues of the body or in the discharges resulting from the inflammations which they induce. In the case of syphilis, there is a special blood test which is called the Wassermann reaction from the name of the scientist who discovered it. A "positive" Wassermann reaction means that the patient has syphilis.

Not only is the laboratory necessary for the diagnosis of venereal disease but it has a particularly important function in treatment. Even though under treatment or without it all visible evidence of syphilis or gonorrhea may disappear, the individual may continue to carry the specific germ of the disease in his body. He may not perhaps transmit the disease to another, but he is always a potential menace to others and in peril himself. Unless the infection in his own body is destroyed, he is likely to become permanently handicapped. So treatment must be continued in syphilis until the patient's blood shows by successive Wassermann tests that he is free from infection. Likewise treatment in gonorrhea should be continued until the germ organism can no longer be found in the discharges from the patient's body. No form of treatment of venereal disease which is not properly controlled by laboratory tests can be regarded as satisfactory treatment.

One of the great difficulties confronting health authorities in dealing with the venereal disease menace is that these patients are not welcomed by private hospitals generally, and in many instances such hospitals refuse to admit them for treatment. This attitude on the part of private general hospitals which appeal for public support cannot be fairly defended, but none the less it exists and must be reckoned with. If adequate facilities for the hospital care of venereal disease patients are not available otherwise, then it is the business of the city government to furnish them at public expense, free for those who can pay nothing, part pay and full pay for those who can pay, according to their ability. The pay clinic plan has much to commend it.

Good venereal disease clinic service is absolutely necessary since the great majority of patients do not require hospital care. Clinics for venereal disease, if not provided by private hospitals or other agencies, should be maintained by the city government, preferably under the supervision, if not actual direction of the health authority. Such clinics should be open day and night. Evening clinics are especially needed to take care of workers who find it impossible to attend clinics regularly during working hours. Here, too, provision should be made for free, pay, and part pay service. Many patients who cannot afford to employ a private physician for necessarily long continued treatment can pay something and should pay something for their care in public clinics.

In connection with both hospital and clinic care of venereal disease patients, the importance of conferring upon the health authority responsibility for seeing that patients remain under treatment as long as is necessary, should be emphasized. One of the most embarrassing difficulties of control is the tendency of these patients to discontinue treatment when the immediately annoying symptoms have been relieved. If the health officer has not the authority which he should have in the matter, and cannot secure it through legislative action, provision should be made in connection with hospital and clinic care of these patients for a competent corps of social investigators who may "follow up" all patients discontinuing treatment and advise and instruct them as to the necessity of completing treatment.

No program of prevention and control of venereal diseases which does not include the utilization of every possible means of public education is an efficient program. Sex hygiene should be taught in the schools to children of suitable age, particularly high school boys and girls, and should be taught only by specially trained teachers. Pamphlets on the subject should be widely distributed among parents and children, and lectures, health exhibits, and moving picture exhibitions should be made use of to the limit of funds available. Even where the local health officer is handicapped for funds for educational work, a great deal of valuable educational material can be obtained for local distribution from state and federal health authorities and from private agencies. We shall consider public health educational measures in greater detail later, but we emphasize them here because reliable information about venereal disease does not reach the average citizen, in most instances, except through official health agencies. A great deal of

his information on the subject when otherwise obtained is merely misinformation.

Hookworm Eradication

Hookworm disease is due to the existence and growth in the body of parasitic worms which are introduced sometimes in food and water, but most often directly through the skin, particularly the skin of the feet. The larvæ of the hookworm develop in the soil in practically all tropic and subtropic regions. Since, in these regions, many persons go barefoot, entrance of the larvæ through the skin is made easy. The incidence of hookworm disease among those accustomed to wear shoes is, therefore, very much less than among others. After entering the body, the larvæ ultimately reach the small intestine where they attach themselves to the intestinal mucous membrane, and develop into adult worms. The hookworm feeds upon the blood of the infected person and produces, in consequence, severe anemia and exhaustion. Treatment consists in the administration of special drugs which rid the intestines of the parasite.

In southern parts of the United States, the disease is extremely common in rural areas where skin contact with polluted soil is more frequent and more direct, and where the disposal of human excreta is not carefully supervised. It has been estimated by United States public health officials that in this country up to a few years ago, there were from a million and a half to two million persons with hookworm infection. The economic loss to the country is tremendous because of the disability of infected persons and the consequent cost of sickness care, to say nothing of the handicaps to agricultural and industrial production. The disease has, however, been greatly reduced in prevalence through the activities of federal, state, and local health authorities in coöperation with the International Health Board of the Rockefeller Foundation, which has carried on a widespread campaign against the disease in this and other countries. There is still much to be done in rural and semirural areas of the south, to provide better sanitary facilities and agencies for treatment of hookworm victims. Although, for reasons stated, the problem of hookworm eradication is not as pressing in the cities of the south as in less well organized communities, many cases are also to be found among city dwellers in the southern states.

There are few diseases so easily preventable in theory since

absolute prevention is contingent mainly upon stopping soil pollution. The disease may, therefore, be completely eradicated if soil pollution is prevented, and infected persons thoroughly treated. But there are many barriers to complete eradication of the disease. Notification of cases is poor in many areas even where compulsory notification is required. Adequate laboratory facilities for the microscopic examination of suspected cases are lacking in many communities, and without laboratory examination, positive diagnosis of the disease is sometimes impossible. Mildly infected persons may feel in good health and will not, therefore, believe they are endangering the health of others. The ignorant are sometimes very much opposed to any regulatory control of their actions by public authorities and their refusal to coöperate in eradication of the disease may seriously hamper the health program. These handicaps, plus the inability of certain communities to support financially the maintenance of sanitary facilities and special health agencies and institutions for hookworm prevention and treatment, make complete hookworm eradication a very difficult matter in rural areas. And as long as rural and semirural populations are infected, the cities must also suffer, even though better equipped both for prevention and treatment of the disease.

In the last analysis, hookworm eradication comes down practically to the health education of the community regarding the dangers of improper disposal of human excreta. No municipal health authority in a hookworm infected region, whatever the sanitary equipment of the city and the facilities for the care of the sick, should omit any of the educational activities necessary to dispel the widespread ignorance about hookworm disease and its relation to soil pollution. Demonstrations of the hookworm under the microscope, and demonstrations also of the simple methods of treatment are particularly useful. The dissemination of information by lectures, bulletins, news articles will help, but the most effective educational service is that provided by an especially trained corps of public health nurses who can carry the message directly into the homes.

Elimination of Insect and Vermin Disease Carriers

There are a number of communicable diseases due to infection by the bites of insect disease carriers and by the contamination of food by vermin, which are of especial interest in certain localities. Among the specific insect borne diseases, malaria holds chief place

due to the wide prevalence of the malaria carrying mosquito in the south. Brill's disease, an infection caused by the bite of the body louse, is also common in many of the large cities. Bubonic plague, caused by the bite of a flea, which lives upon plague infected rats, is rare in this country because of rigid quarantine of ships and cargoes from plague infested ports of other countries. But seaport cities, particularly, must always be on guard against it. The prevention of these and other infections of a parasitic nature consists mainly in sanitary regulation of environmental conditions which contribute to the growth of insects and vermin. We shall, therefore, consider them in greater detail in Chapter XII, on sanitary inspection.

Some Special Procedures of Communicable Disease Control and Their Significance

It is impossible in this brief discussion to present in full detail a description of all procedures for control of communicable diseases previously outlined. Such information is available in the standard regulations adopted by the American Public Health Association, which form the basis of the best modern practice. Although the principles governing control of communicable diseases are substantially the same for all diseases, there are, of course, variations in practice dependent on disease sources, their modes of transmission, and the circumstances of individual cases.

Among the special procedures of control of communicable diseases which have the sanction of usage is "placarding" the premises occupied by the patient. Placarding consists in posting on the front of the house or on the door of the apartment in which the patient is sick, a notice prominently displaying the name of the disease and prohibiting the entrance of unauthorized persons. The procedure of placarding varies widely in different communities. The majority of municipal health authorities require routine placarding for diphtheria, scarlet fever, smallpox, poliomyelitis (infantile paralysis), cerebrospinal meningitis, mumps, whooping cough, measles, and chickenpox. Typhoid fever and certain other less readily communicable diseases are placarded in a few cities. Undoubtedly placarding does have a certain educational value in that it puts the community on its guard and identifies the danger points. An efficient health officer does not, however, rely greatly upon placarding for control. He insists upon proper isolation of the patient under competent medical supervision, the restriction

of movement of exposed susceptible persons, and frequent visitation by health inspectors to see the sanitary regulations are carried out.

Since the majority of communicable diseases run a definite course and the danger of the patient transmitting disease to others is less after the disease has run its course, it is common practice for health authorities to authorize the release of the patient from supervision when a fixed quarantine period has elapsed. Sometimes release is permitted prior to this time on the certificate of the physician that the patient is free from infection. These procedures may be quite satisfactory in many instances, but not in all. It quite often happens that the disease runs its customary course and the patient is apparently without infection, yet actually capable of transmitting disease to others as a "carrier." The establishment for the various diseases of fixed periods on the termination of which a patient will be released from supervision is, therefore, not good practice. No inflexible time limits should be set, but the health officer should determine by examination of the patient and laboratory test, when necessary, whether or not release of the patient is warranted. He should not accept the physician's word as to the patient's freedom from infection, unless he has satisfied himself that this is the fact. The physician may feel justified in giving the patient the benefit of the doubt; the health officer's responsibility is, however, not to the patient but the community at large.

No matter how thorough the measures which may be applied by the health authority in control of the sick patient, the laboratory must, many times, be depended upon to determine when it is safe to release the patient from all supervision. This is because there are so many disease "carriers." The carrier diseases are of four general types, namely, (a) those in which the specific microörganism remains in the intestinal or urinary tract of the patient, as typhoid fever, cholera, and dysentery; (b) those in which it remains in the mouth or oral cavity, as diphtheria and pneumonia; (c) those in which the nose and nasopharynx contain the infective microörganism, as cerebrospinal meningitis and poliomyelitis; (d) those in which it is held in the blood or other tissues, as malaria and yellow fever. It is apparent that since the carrier is commonly without symptoms of the communicable disease, laboratory tests of discharges from the intestines and urinary tracts, from the mouth, nose, and throat, and of blood and other tissues must be

relied upon to determine when the patient may properly be released from supervision. To release from control any patient who might be a carrier of disease without the assurance of his freedom from disease which the laboratory alone is capable of giving might easily result in a spread of the disease to epidemic proportions. For the various carrier diseases the standard regulations for the control of communicable diseases call, therefore, for continued supervision of patients until laboratory test has found no evidence of the existence in their bodies of the infective microörganisms in an active state, *i.e.,* capable of producing the disease in another person.

The following quotation from a study of communicable disease control in Montreal illustrates some of the common defects of control of carriers:

> Under the present regulations of the department of health, a patient suffering with diphtheria shall be isolated during the last four weeks to be counted from the actual beginning of the disease. If the physician requests termination of isolation before this period had elapsed release may be granted if two bacteriological examinations made 48 hours apart have given negative results and if a certificate to this effect is presented to the contagious disease division by the physician in charge of the case.
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> This regulation is defective in that it does not require proof of the freedom of the patient from infection (as demonstrated by bacteriological examination), except when release from isolation is desired before the end of the stated period of isolation. It is a well recognized fact that patients who have had diphtheria and have apparently recovered are in many instances capable of transmitting the disease to others. In other words, they may remain "carriers" of the disease long after the membrane has disappeared from nose or throat. The mere fixing of a time limit of isolation does not guarantee that the patient is no longer a menace to the health of others, the only positive proof being the absence of the infective organism from the nose or throat.
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> Furthermore, the present regulation is defective in that it does not insist that the bacteriological examinations of cultures from the nose or throat shall be made by the laboratory of the department, that is, an official examination.
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> To correct these defects and insure that no patient shall be released from isolation for diphtheria until absolutely free from the disease, it is recommended that the department require *in all cases* in which the patient is not removed to a hospital that two cultures from the nose or throat of the patient, taken not less than 24 hours apart, shall be found negative before his release from supervision, and

that the bacteriological examination of these cultures shall be official, that is, made by the health department laboratory.

In the hospitals similar procedure should be insisted upon except that the bacteriological examination may be made in the hospital laboratories.

The result of this procedure will unquestionably demonstrate that there are a large number of children who are "carriers" of diphtheria even though they have apparently recovered from the disease. Such children should be isolated, or kept under supervision, until the diphtheria bacillus has disappeared from their throats.[8]

The Rôle of Disinfection in Communicable Disease Control

Disinfection of premises following communicable disease is a time-honored procedure and deserves special consideration chiefly because of the quite general misconceptions about its efficacy in disease prevention. Disinfection means the destruction of the life or vitality of disease-producing microörganisms by chemical or physical means. In common practice disinfection is further defined as "concurrent" or "terminal." Concurrent or mediary disinfection is the immediate disinfection of the bodily discharges of the patient or other substances and articles which may have been contaminated by his use of them. Terminal disinfection is the cleansing of the person, premises, clothing, bed linen, etc., of the patient at the time of his release from supervision.

Concurrent disinfection is the most important phase of disinfective procedure. When it is thoroughly carried out, about all that is necessary prior to the release of the patient is to give the premises a thorough cleansing with soap and water and exposure to fresh air and sunshine. The germs of disease do not live long except in the human body or in the discharges from it. All articles used by the patient which are likely to retain the secretions from the patient should be thoroughly washed, or if washing is impracticable, should be burned.

It is still the practice of the health officers of many communities to rely upon terminal gaseous disinfection or "fumigation" of premises prior to the release of the patient from control. The present trend is, however, to do away entirely with fumigation and to substitute for it the measures of concurrent and terminal disinfection or renovation described. A great deal of evidence has been produced to show that fumigation as ordinarily practiced is

[8] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Montreal, Canada,* 1918 (typewritten), pp. 1233-1234.

not only incompetent to disinfect premises but tends to give the public a false sense of security against disease. Some health officers have described fumigation as merely "offering incense to false gods." Certainly, the experience of health officers who have discontinued the practice of fumigation in terminal disinfection tends to prove that it is on the whole a waste of time and money. Yet many able health officers continue the procedure and believe it of considerable value. Newark, New Jersey, is one of the larger cities which still continues terminal disinfection by fumigation. The following excerpt from a report on the Newark health department in 1919 sums up the argument against fumigation and suggests a test of the efficacy of fumigation prior to its discontinuance as routine procedure:

> Even granting that the technical procedure of terminal fumigation is thoroughly carried out, there is a growing conviction among health authorities that terminal fumigation is not the important agent in the prevention of infection it was once believed to be. Routine terminal fumigation has been discontinued in Providence, R. I., Rochester, N. Y., Boston, Mass., Milwaukee, Wis., New York City, and elsewhere. The experience of New York City is illuminating. In 1915, fumigation by the department of health was discontinued in the boroughs of Manhattan, Bronx, Queens, and Richmond, but continued in Brooklyn as a control in all cases of scarlet fever, and in those cases of diphtheria which were terminated by death or removal to a hospital. A record of original as well as later cases was kept in each borough, and it was found that there was not sufficient difference in the control of these diseases with and without fumigation to warrant the continuance of fumigation as departmental procedure. Accordingly, terminal fumigation was discontinued throughout the city. Results since 1915 have entirely justified this decision, and the city has been saved about $30,000 a year.
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> Dr. S. F. Knause of the New York City Health Department, in a paper read before the American Public Health Association in 1915, concludes with reference to terminal fumigation that:
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> 1. There is a certain percentage of cases over which there is no administrative control.
> 2. Mediary disinfection is a most important factor, neglected both by the attending physician and the department of health, entitled to much greater attention and strict supervision.
> 3. Terminal disinfection by cleansing and renovation are desirable from a psychological and sanitary view, and in certain instances like tuberculosis should be rigidly enforced.

4. Terminal fumigation is a costly procedure, the method and reliability have no weight, as the necessity of procedure of this kind is an admission of improper isolation, imperfect mediary disinfection, or improper termination. As a factor in the control of communicable diseases it is of negative value.

Dr. Hibbert W. Hill, formerly executive secretary of the Minnesota State Public Health Association and one of the leading epidemiologists of this country, states that after a careful test to determine whether or not germs could be found in rooms of patients about to be released after diphtheria and where no fumigation had been done, it was found that out of one thousand cases, diphtheria bacilli were identified in only one instance, and that on a pillow. These bacilli would of course have been taken care of by proper cleansing of bedding. In rooms where patients with advanced tuberculosis had been lodged, tubercle bacilli were found to live as long as four weeks after they were deposited on the floor, although this was quite exceptional. Dr. Hill, therefore, makes this reservation in regard to discontinuing fumigation—that if a room is to be occupied within a month after the death or removal of a tuberculous patient, it is well to disinfect the room by fumigation or otherwise. But if more than a month elapses before the room is occupied, disinfection is not needed.

The health officer of Newark is convinced, however, from his own experience, that fumigation serves not only to control the spread of infection, but also to educate the public in the prevention of contagious disease. He feels, also, that the visits which are made by uniformed men to the premises have a decided effect in preventing the violation of quarantine. In view of this opinion from the health officer, it is not recommended that fumigation be discontinued at once, but that a test be made to determine its effectiveness, not in the laboratory, but in the field. It is suggested that, as in New York City, disinfection by fumigation be discontinued in one section of the city, and that at the end of a six-months' or one-year period the results of terminal fumigation and proper mediary or concurrent disinfection be compared. It is further suggested that in that section of the city in which fumigation is discontinued, nurses instead of lay inspectors be appointed to make home visits and instruct patients and members of their families in the prevention of infection and the observance of quarantine.

If at the end of the trial period, results show that fumigation as a routine city, wide procedure does not justify itself, and that nurses are more efficient than the present inspectors, then fumigation should be discontinued and contagious disease nurses should be employed in place of lay male inspectors. If this is practicable, considerable

saving of money would result. Efficient nurses can be secured for lower salaries than male inspectors, and the cost of service would be still further reduced because the purchase of materials for fumigation would no longer be necessary.

If under a policy of nonfumigation, it were found that citizens still desired fumigation, they should be permitted to have it, but they should be required to pay the cost. A fee might be charged sufficient to cover the cost of materials and the time of the inspector.[9]

The health officer of Milwaukee, Wisconsin, who discontinued fumigation more than ten years ago, makes this excellent statement of his position in his report for 1915: "The health department has discontinued the practice of fumigating in cases of contagious disease. The department has decided, after careful investigation, that fumigation is of no particular value and that it is a waste of money. Furthermore, it becomes a real danger when it creates a false sense of security. That is, when formaldehyde or other fumigants are used the family believes that thereafter it is perfectly safe from further infection. . . . Scrupulous cleanliness, fresh air, and sunlight are better disinfectants than any of the preparations which have been used for this purpose." It can be fairly said that this is the view of most health officers and it is likely that within the next ten years routine fumigation for communicable diseases will be an obsolete procedure.

Occupational Disease Registration and Control

Special mention should be made here of the registration of occupational diseases. Complete registration of these notifiable diseases is necessary in order that the conditions of occupation which cause them may be corrected. Their prevention is not of such primary importance to the public because they are not communicable and not as common as the communicable diseases. They are none the less the cause of many avoidable deaths.

In most states the investigation and regulation of conditions of employment are the responsibility of a state department of labor The usual procedure of registration is for the local health authority to receive the reports of occupational diseases as made by local physicians and forward them to the state department of labor for

[9] New York Bureau of Municipal Research, *A Survey of the Government, Finances, and Administration of the City of Newark, New Jersey*, 1919 (typewritten), pp. 255-258.

further investigation. This should not, of course, absolve the local health authority of all responsibility in the matter, for after all, the protection of the citizens of his own community from all possible disease dangers is a duty which no health officer should neglect. If the state authority responsible for investigation of occupational diseases should not make adequate investigation of them or should not be capable of providing the necessary protection for local communities, it is the health officer's business to take advantage of all possible opportunity to discover and correct conditions. He may have no legal responsibility in the matter, but certainly he has a moral responsibility.

Whether reports of occupational diseases are made directly to the local health authority or to some state authority, the local health officer should be alert to discover any facts about such diseases which bear upon his own program. If original reports go directly to a state department, he should request information from that department about them and the results of investigations made by that department. To illustrate this point, the following comment upon the procedure of registration of occupational diseases in Michigan and its bearing upon local municipal health administration is of interest.

No record is maintained of several important preventable diseases which should be of interest to the department. For example, a state law requires that physicians shall report certain occupational diseases to the state board of health. The state board of health is required to transmit a notice of such report to the commissioner of labor and the commissioner of labor and the prosecuting attorney of the county are directed to prosecute physicians for failure so to report these diseases. Although this act, a necessary one for the protection of workers, was passed in 1911, no such reports have apparently ever been made either to local or state officials. The director of the bureau of vital statistics of the state health department when asked about the matter by letter disclaimed responsibility and referred the writer to the commissioner of labor. The commissioner of labor stated, when inquiry was directed to his office, that responsibility for receiving such reports was, under the law, upon the state health department, and that since the enactment of the law no information had been received by his office from the health department regarding occupational diseases. Thus it is clear that unless there have been no cases of occupational disease in Grand Rapids and no deaths from any such diseases, an unlikely assumption, this law has been a dead letter. It can be said with safety that in Grand Rapids with its

many industries where lead, phosphorus, arsenic, mercury, and other poisons or their compounds are used, there have been many unreported cases of occupational disease and doubtless many avoidable deaths from such causes.[10]

As a check upon the registration of occupational diseases, the death returns should be examined in all cases where there is an apparent relation between the occupation of the deceased and the cause of death. In many instances, investigation of the circumstances of death in such cases will reveal conditions calling for correction by the health authority. The importance of having complete and accurate statements on the death certification of the occupation of the deceased and the cause of his death should be particularly emphasized in this connection. If, for example, the cause of death was a condition which might have resulted from lead poisoning, and the deceased person was a printer, inquiry might indicate conditions needing correction in the place where he was employed. It is unusual to find that the connection between occupation and cause of death can be thus readily defined, but careful review of death certificates by a registrar who understands the part which occupation plays in sickness, will often indicate the need not only for better registration of occupational diseases, but also for inquiry as to sanitary conditions in industrial plants. This is a fertile field of study.

Special Problems in Community Health Protection

Thus far we have considered only the notifiable diseases, chiefly the communicable and occupational diseases, the great majority of which are preventable by the application of known measures of control of patients and destruction or elimination otherwise of disease-causing agents. There are, however, many diseases and defects which are not notifiable and though not subject to official supervision by the health authority under the law, are none the less reducible, if not preventable, through public education and the provision of adequate care and treatment of the sick. We cannot discuss all of these conditions here, but several are of such character and such prevalence as to warrant municipal health authorities taking a more active part in their prevention than they have in the past. These are cancer, mental disease and defect, heart

[10] New York Bureau of Municipal Research, *Report on Grand Rapids Health and Hospital Survey*, 1923 (typewritten), pp. 69-70.

disease, particularly among children, endemic goitre, pellagra, and narcotic drug addiction disease.

In his official capacity, the municipal health authority may not be under any legal obligation with respect to the prevention of diseases of the type named. As the health advisor of the community, he has, however, a direct responsibility for making available to his community all the facts necessary to guide the individual in his personal warfare against sickness, and to see to it that every sick person incapable of self help has the help of the community. This means that the health officer's activities with respect to these non-notifiable diseases should be directed along two chief lines:

1. The collection and dissemination of all available information regarding the prevalence of such diseases and their prevention and treatment.

2. The coöperation with all other official and unofficial agencies in the development of the best possible facilities for the diagnosis and treatment of sufferers from these diseases.

The Prevention of Cancer

Cancer, as already noted, is included among the notifiable diseases of the model law for morbidity reports. It is not, however, commonly reported to health authorities prior to death. The cause of cancer is not known, although there is evidence that, in the majority of instances, there is a history of previous injury to gland cells of the body either by physical or chemical agents acting from without the body or by toxic substances created in the body and not eliminated or neutralized by normal processes. Cancer is not, as far as is now known, a germ disease, although it may undoubtedly result, in some instances, from injuries to gland tissue, which occur in certain infections.

Cancer is steadily increasing and now causes about one death in every ten after the age of forty. Its prevention and scientific treatment are, therefore, a health problem of major importance in every community. The limitations of this volume do not permit discussion of cancer treatment, except to note that the city health authority should be responsible for seeing that no cancer sufferer goes without adequate medical care and treatment. We may regard official responsibility in the matter as limited to the carrying on of educational activities regarding the signs and symptoms of cancer, the necessity of prompt examination and treatment when cancer is feared or suspected, and such other facts about the

disease as have been made available by the American Society for the Control of Cancer, and other agencies for cancer research.

As far as is now known, there are no specific, positively preventive measures against cancer which can be applied by the individual or his medical advisors. Many authorities on the subject hold that since errors in diet so often result in the accumulation of cell-damaging toxic substances in the body, the avoidance of such errors is a preventive measure of great value. It is certain that the prevention of undue stress and strain or other injury to those gland tissues of the body which are particularly prone to cancer growth is to be guarded against. It seems probable that the injuries resulting from many of the acute infections of childhood, and the existence of uncorrected physical defects of children are factors which contribute materially to cancer prevalence. Certainly any disease or defect which interferes with the normal growth and functioning of the body tends to produce changes in the body which may both contribute to cancer growth and hamper its effective treatment. In the educational campaign against cancer, the health officer should, therefore, stress the importance of prevention of infectious diseases, the correction of physical defects of children, and the avoidance of abuse of the body in eating, drinking, smoking, work, and play.

Mental Hygiene, a New Field of Municipal Health Work

With respect to mental disease and defect, our laws do not generally recognize the condition as one calling for supervision by public authorities until the sick person has reached a stage of mental deterioration which causes him to be troublesome or dangerous to society, or so incompetent otherwise that his commitment to a place of observation or detention is warranted. When that time comes, it is often too late to do anything to check the progress of the disease or correct the defect. Many cases of this kind can, however, be restored to health if recognized early and properly advised and treated. Even those who cannot be restored to complete mental health may be so improved that they can continue for a long time in the enjoyment of freedom from restraint and as useful members of society.

The causes of mental disease and defect are as yet only partly understood, but the tremendous burden which the public is called upon to bear in caring for the mentally incompetent has so stimulated scientific research that much about their causes which is now

hidden will probably be clearly revealed in the next decade. It is already known that many of the mental defects and diseases are curable, and many persons are in fact being cured who were formerly thought to be hopelessly incurable. As knowledge of the causes and methods of treatment of mental disease and defect is bettered, and community education in public and personal hygiene fostered, it may confidently be expected that measures for the prevention and control of these diseases will eventually be regarded as essential municipal health activities.

Much can be done by local health authorities to prevent and correct mental diseases and defects, even with the limited information at their hands. Whether this is now properly a field for action by municipal health authorities or by other authorities, local or state, is a question which can only be answered by study of local conditions. State governments, as a rule, maintain the institutions for treatment of mental disease and defect, and it would be logical, therefore, for such governments to provide the necessary local preventive and corrective measures. On the other hand, the problem of prevention is one which is so closely related to other problems of urban life that it would seem capable of more satisfactory solution by local authorities, in the largest cities at least. Public health administration in its broadest sense means more to-day than protection of physical health; it means the protection of mental health. *"Sana mens in corpore sano"* represents the ultimate aim of the modern health department, and in many of the larger cities, mental hygiene clinics are now provided either under the direction of the health authority or in connection with public hospital services otherwise directed. Their value in the large cities has been so clearly demonstrated that within a few years, there will probably be an extension of municipal health work along similar lines, in the great majority of cities of over 100,000 population. The National Committee for Mental Hygiene, a private organization, has been the leader in developing municipal health activities for the promotion of mental health. Its research and educational advisory service is available to any community and should be utilized by health authorities everywhere.

Heart Disease, a Major Problem

Among the causes of death, heart disease has always stood well toward the top of the list. As now recorded in mortality statistics, deaths from this cause show a steady increase from year to year,

particularly at ages above forty. In 1900, the general death rate from heart disease in the registration area of the United States was 132.1 per 100,000 population; in 1923, it had risen to 175.3. Some of this increase is possibly only apparent, due to better diagnosis of the disease and more accurate registration of the causes of death, but improvement in diagnosis and certification of the causes of death is probably only a minor factor in the situation. At the present time approximately 14 per cent of all deaths are due to diseases of the heart.

The health problem is much greater than these figures indicate, for the condition which ultimately produced death though not recorded as heart disease may have been aggravated, or recovery from it prevented, by heart impairment. Not only that, the mortality statistics give no true measurement of the tremendous loss of human vitality and economic competency from heart disease, even where death does not occur from that cause. Statistics are not available to show how many public dependents became so because of disability due to heart disease, but certainly the number is great, as the records of public institutions for the dependent indicate.

The problem of preventing heart disease is primarily one of preventing infectious diseases, and minor focal infections as of teeth, tonsils, and other parts of the body which are readily susceptible to infectious processes. Prevention of heart disease calls, therefore, for official use of all measures available against the infectious diseases, the provision of adequate facilities for dental hygiene, removal of diseased tonsils, and other measures directed especially against infections of all kinds, local and general. It goes without saying that the community should be prepared also to furnish adequate hospital and dispensary facilities for those suffering with heart disease who need institutional care. Many such persons can, by proper medical treatment and wise supervision of their modes of living, be protected against serious disability, and so directed in their occupations and recreations as to overcome their handicaps.

The most effective educational work for the prevention of heart disease is now being done by private agencies such as the American Heart Association, which maintains a central office in New York for the collection and dissemination of information on all phases of the heart disease problem. This association grew out of the Association for the Prevention and Relief of Heart Disease, estab-

lished in New York City in 1915. Its purpose, as expressed in its published reports, is: "to gather information on heart disease; to develop and apply measures that will prevent such disease; to seek and provide occupations suitable for heart disease patients; to promote the establishment of special dispensary classes for such patients; to extend the opportunities for adequate care of cardiac convalescents; to urge the provision of permanent institutional care for such cardiac patients as are hopelessly incapacitated for self support; and to encourage the establishment of associations with similar objects in other cities." This admirable statement of purpose well serves as an outline of work to be undertaken by health officers in all cities.

Endemic Goitre, an Easily Preventable Disease

Simple goitre is an enlargement of the thyroid gland due to a deficiency of iodine in the body. The disease is endemic in this country in the region of the Great Lakes, the St. Lawrence River basin, and certain parts of the Pacific northwest. In these areas, goitre is extremely common, particularly among children. In Cincinnati, of 47,493 elementary school children examined, 15,751 or 33.2 per cent were found to have enlarged thyroids. About 27 per cent of boys and 40 per cent of girls were so affected.[11] In Grand Rapids, 30 per cent of 26,215 school children had enlarged thyroids and of these 30 per cent were boys and about 33 per cent girls. Other "thyroid surveys" have shown similar conditions in several of the cities in the Great Lakes region.

The condition is one which may not be readily recognized, unless there is a visible lump at the front of the neck, but there is often marked enlargement of the thyroid without the appearance of swelling. The person with a simple goitre of slight degree may suffer little distress except that caused by anxiety about the swelling of the throat, if this exists, but if the condition remains untreated there may eventually be quite serious health impairment with marked disturbance in body function. Operative treatment may sometimes be necessary in order to prevent permanent disability, even death.

It is not our purpose to consider the treatment of simple goitre, as this is a matter which must be left largely to the private physicians. Prevention of the condition is, however, now recognized as

[11] Robert Oleson, *Thyroid Survey of 47,493 Elementary School Children in Cincinnati*, Reprint No. 941 from Public Health Reports, July 25, 1924.

an important responsibility of public health authorities, particularly in cities where the condition is endemic. According to Marine, one of the pioneers in goitre research, "simple goitre is the easiest known disease to prevent." Its prevention consists merely in furnishing the people in the regions of goitre prevalence with sufficient iodine to supply body needs. Although this means of prevention of the disease has been known and used for a great many years in other countries, it was not until the studies of Marine and Kimball in Akron schools, in 1917, that the administration of iodine to large groups of populations came into general use in America. Authorities differ with respect to the method of iodine administration. In Rochester, New York, Dr. George W. Goler advocates the treatment of the city water supply with iodine in water soluble form, and this is now done as a matter of routine by the city department of water supply. In Grand Rapids and several other cities, chocolate coated tablets containing iodine in an easily assimilable form have been extensively used as a preventive among school children. Since salt is an essential article of diet, many health officers recommend the general use of iodized table salt, and leading salt manufacturers now have such salt on the market. It has been suggested that in view of wide prevalence of goitre, the federal government require that all table salt be iodized. The salt is not changed to taste by this treatment, and if regularly used is probably an effective preventive. Iodine treatment of the water supply of the community is quite satisfactory in the opinion of Dr. Goler of Rochester, but it is contended that such method results in waste of iodine because so much of the city water is used for other than drinking purposes. Whatever the preventive method of choice in any goitre endemic community, the health officer who fails to carry on a purposeful campaign of education in goitre prevention is neglecting a very fertile public health field.

Pellagra in Southern States

Pellagra is a disease which is particularly prevalent in the southern states. Although occasional cases were noted in this country prior to 1908, it was not until that year that the extent of the disease was recognized. At the present time, it is estimated that there are in the neighborhood of 50,000 cases in the United States, and it is endemic or always present in certain rural districts. It is a disease which produces serious disability and a great variety of distressing symptoms referable chiefly to the mental and nervous

system, the skin, and the intestinal tract. It is not a germ disease, and is not communicable. As far as is now known, it is the result of deficiencies in diet and, as might be expected, it is found more frequently among those whose economic circumstances or places of living compel the continued use of a restricted diet. The precise nature of the dietary defect is a subject on which there are differences of opinion, but the disease is prevented and cured by the use of a varied diet which includes fresh fruits and vegetables, milk, eggs, and lean fresh meat.

In all cities where pellagra exists or where conditions of living are conducive to its development, pellagra should be included among the notifiable diseases, and the known measures of its prevention carried out to the limit of the health authorities' resources. Advice to the public regarding pellagra preventive diet should be a part of the health officer's educational work, and it should be his duty to see that all possible community resources are taken advantage of to supply the proper diet and good medical care to those who cannot obtain these unaided. In many of the southern cities, there are many sufferers from pellagra who show no readily visible signs of the disease on the skin, and may, therefore, continue for a long time in partial disability. The weakened resistance of the *pellagrin* makes him fertile soil for other diseases, especially tuberculosis, and it is desirable for the health protection of the community as a whole that the pellagra victims be identified and promptly treated. It is hardly possible, however, to exercise satisfactory control of the disease, except where notification is required, and even with notification, there are many needing public aid who will fail to receive it, unless the health officer makes special effort to discover them.

Narcotic Drug Addiction Disease

The term narcotic drug addiction disease as used here means that pathological condition caused by continued use of opium and certain of its derivatives, of which morphine is the most widely used. This condition, which was formerly held to be merely vicious habit, is now regarded by physicians, who have had widest experience in its observation and treatment, as a definite disease entity. Although there is considerable difference of opinion among medical authorities with respect to the pathology of the disease and the therapeutic measures most serviceable in its treatment, there is a quite general agreement among them that the problem of preven-

tion and cure of the disease is one of major health importance. What should be done is, however, quite another matter.

The whole subject of narcotic drug addiction disease unquestionably needs the most careful study. National and state laws and regulations designed to limit the use of narcotic drugs have been enacted and enforced without thorough scientific examination of all the facts bearing upon conditions of drug use and abuse. Opinions on what is needed to protect the public health from abuse of narcotic drugs have been broadcast by eminent physicians, health officers, clergymen, police officials, judges, social workers, and others, many of whom are not in possession of sufficient information about the matter to give their opinions any scientific value whatever. Police authorities have proclaimed that all narcotic drug addicts are criminals or potential criminals, and "crime waves" have been quite generally attributed to a supposed increase of drug addiction. The enforcement of the prohibition law has been decried by some as contributing to the abuse of narcotic drugs, and others have as insistently declared that the prohibition of intoxicating liquors has resulted in a decrease in the demand for narcotics. Aside from the fact of the agreement of all who discuss the subject that abuse of narcotic drugs is a serious menace to public health, there is little evidence that can be relied upon by public officials to guide them in determining what official action, if any, should be taken.

Estimates of the number of narcotic drug addicts, *i.e.*, persons addicted to the use of opium and its derivatives, varies from 100,000 to 1,000,000 or more. These estimates can be little more than guesses because of the practical impossibility of discovery of all cases. It is certain that there are many more drug addicted persons than can possibly be discovered in the records of hospitals, penal and correctional institutions, and other agencies dealing with these unfortunates. A great majority of narcotic drug addicts are patients of private physicians, and since physicians are not required to report to public health authorities regarding these patients, the confidential relations of physician and patient remain inviolate. Every physician within the writer's acquaintance, who has practiced long in his community, numbers among his patients worthy citizens in every walk of life,—lawyers, judges, bankers, clergymen, business men, laborers, even nurses and physicians—who are drug addicts. These individuals may go about in the community without anyone being aware of their condition and, as long

as they can obtain enough drug to keep in physical and mental balance, may carry on their customary activities without any apparent disability.

In a few cities, clinics have been established and special institutional services provided for the treatment of narcotic drug addicts, but these agencies have generally failed to accomplish their purpose of cure of the disease, either because treatment was left to incompetent physicians or because their work was carried on under laws or regulations which made scientific medical treatment impossible. The federal narcotic drug act (Harrison Act) has undoubtedly served to restrict illegal traffic in narcotic drugs, but the rules and regulations which have been drawn by enforcing authorities relative to the therapeutic use of narcotic drugs by physicians in their practices have resulted mainly in forcing the drug addict out of the hands of the physicians and into the hands of the drug bootleggers.

In view of the lack of accurate data on the extent and character of narcotic drug addiction in this country, and the wide differences of opinion which exist even among those most competent to suggest methods of prevention and treatment, final decision as to what part municipal health authorities should take in the solution of the problem must wait upon scientific research. It is certain, however, that health officials can contribute greatly to scientific research regarding narcotic drug use and abuse by gathering such facts about the situation in their own communities as may be available. They can contribute, also, to the reduction of narcotic drug addiction by public health education and by helping to provide good facilities for the care and treatment of narcotic drug victims.

There are certain well established truths regarding the therapeutic uses of narcotic drugs which all should know and which should guide officials and public in their thought on the matter. These are:

1. Opium and some of its derivatives, chiefly morphine, are extremely valuable drugs in medical practice, and, in the opinion of most physicians, there are no satisfactory substitutes for them in the treatment of many serious diseases and injuries. The same is not true of other narcotic drugs used in medical practice, nor even of certain opium derivatives, as codeine and heroin. This distinction should always be borne in mind.

2. The condition of narcotic drug addiction caused by the continued use or abuse of opiates is a distinct disease entity calling for

the most skillful medical treatment. It is not merely a habit of which the patient can be "broken" by compulsory withdrawal of the drug according to the notions of well intentioned but medically untrained persons.

3. Since physicians are the only persons competent to say when and how narcotic drugs should be used in treatment of the sick and injured, regulatory enactments must recognize this fact and give physicians the right to use really necessary narcotic drugs within reasonable, scientifically determined limits, and according to their professional judgment. There is no rule with respect to the quantity of drug to be given at one time or the duration of the period of drug administration which can be universally applied in the treatment of the sick, whether addicted to drug use or not.

4. To regard all narcotic drug addicts as criminals or potential criminals, or to hold them all up to public scorn as weak willed degenerates, defeats the very purpose of laws designed to prevent drug addiction and protect the public from illicit drug traffic. Drug addicts should be regarded as sick persons entitled to the same kindly and considerate care as other sick. If not so dealt with, it will always be difficult to find out who the drug addicts are and to provide for their proper care. Illicit traffic in narcotic drugs will be encouraged in direct proportion to the enforcement of laws which stigmatize all drug addicts as vicious persons.

5. Facilities for good medical care of all drug addicts, whether criminal or not, must be provided at public expense, if necessary. In hospitals, dispensaries, jails, penitentiaries, and other institutions, treatment of narcotic drug addicts should be entrusted only to skilled medical practitioners. The practice in many penal correctional and custodial institutions of permitting laymen to determine the procedure of "breaking" the drug addict of his supposed habit should no longer be tolerated.

Little has been written on the subject of prevention and treatment of narcotic drug addiction which can be accepted without many reservations. Among those who have made greatest contribution to an interpretation of the drug addiction problem and the value of existing legislation on the subject is Dr. Ernest S. Bishop. His discussion of the subject sheds a great deal of light upon what is wrong with the time honored "cures" of drug addicts, and suggests how the situation may be remedied.[12] Recently, a comprehensive program of scientific study of narcotic drug addic-

[12] Ernest S. Bishop, *The Narcotic Drug Problem*, 1920, pp. 41-49.

tion and related problems has been undertaken by a special committee on drug addiction of the Bureau of Social Hygiene of New York City. The report of this committee has not yet been made available for public review. Several national organizations are now in the field with the announced purpose of combatting drug addiction, but none of these organizations is in a position to carry out their purposes intelligently because of the lack of thoroughly substantiated data on all phases of the problem. It seems quite likely that in view of special research now being carried on by individuals and organizations, the basis at least will soon be laid for coöperative community effort against the abuse of narcotic drugs.

Organization and Personnel for Prevention and Control of Disease

The organization of municipal health work for prevention and control of disease naturally varies considerably with the size of the community. In a small city of from 10,000 to 25,000 population, the organization may be a simple one. The health officer, if he is a physician, as he usually is, may be the sole employee, or he may have a clerical assistant in charge of office records of disease, with perhaps one or two inspectors or nurses to help him in routine field investigation and supervision of cases.

As the population of the community increases, the number of cases of disease increases accordingly, and so the control force must be expanded. Eventually, a point is reached in population when the general executive duties and responsibilities of the health officer prevent his personal attention to field work. The increase of population which results in a more complex and closely woven social and industrial life in the community, is conducive to more and more varied human contacts and relations and therefore more opportunities for the transmission of disease. So in a city, say of 100,000 or more inhabitants, the problem of disease prevention and control becomes one requiring not only many highly specialized activities but also a high degree of special training and experience on the part of supervisory officers. The usual practice is to establish in the health department, (or health bureau, if the health service is not an independent department), a special division or unit for preventable disease diagnosis, research, and supervision. At the head of this division or special unit, called a division of preventable or communicable diseases, there is commonly a medical officer as chief or superintendent who is skilled in the diagnosis of disease

and in the management of preventive work. He should have a clerk for office duty to take charge of the registration of the diseases and the various facts on which control must be based. A field force of trained nurse inspectors under the direction of this medical officer should be provided to make routine investigation of cases, see to the isolation of patients, establish and supervise quarantine, coöperate with physicians as necessary, and in general instruct the patient and others in hygiene and sanitation.

It is only within the past twenty years or so that the value of the trained nurse as a field agent in preventable disease control has been fully recognized. There were relatively few health departments prior to this time which employed trained nurses in communicable disease work and the inspectional and investigational work required was performed mainly by male sanitary inspectors who were often without capacity for anything but the merest routine. To-day, the tendency is to replace such sanitary police with trained nurses wherever possible. The trained nurse is better able to deal with the situations ordinarily encountered in the home. She is more appreciative of the problems of sickness care, more tactful and sympathetic in dealing with children who make up such a large proportion of the sick, and better able to secure the coöperation of the women of the household on whom the burden of the care of the sick ordinarily falls. Her special training as a nurse gives her an understanding of disease and its management which the average lay male sanitary inspector lacks. Furthermore, since trained nurses can usually be secured at lower salary rates than male sanitary inspectors, their employment permits material budget savings.

The assignment of nurses in communicable disease work depends considerably on the general plan of nursing service adopted by the department. Many health officers hold that nurses doing communicable disease work should do nothing else. Even in this comparatively limited health field the nursing activities are sometimes so highly specialized that there is a special squad of nurses for tuberculosis, a special squad for general contagious disease work, a special squad for venereal disease work, a special squad for tuberculosis work, etc. Other health authorities believe it more practicable and more economical of nurses' effort to consolidate all nursing service in a single unit, district the territory of health jurisdiction, and assign a trained nurse to each district to carry on any and all activities for health promotion that may be necessary

within that district. Control of communicable diseases would be under such plan only one of many duties of such a nurse.

The two plans, the first, specialization of nursing service, and the second, generalized district nursing, are both found in efficient municipal health departments. The generalized district nursing plan has, however, received hearty endorsement by health authorities wherever it has been tried, and will probably find greater favor as time goes on. With the multiplication of health activities for which the trained nurse is apparently so well fitted, overspecialization of nursing service tends to waste and extravagance of public health expenditure through an inevitable duplication of nursing effort and, in many instances, an unbalanced health program. We shall discuss this subject at greater length in the next chapter on child hygiene and public health nursing, since in modern health administrative practice, protection and promotion of child health constitute the major part of the public health nurses' contribution to efficient community service.

Up to a certain point specialization in the prevention and control of disease is desirable. There must be specialist technicians in public health administration just as in the field of clinical medicine. Efficient health administration requires, however, that these special disease controlling activities shall be coördinated under a single directing officer in order that all phases of the program may be given their due weight without overemphasis of any. Although in many health departments one finds tuberculosis and venereal disease control given special recognition as independent bureaus or divisions, the plan of organization most favored is to provide for one bureau of communicable or preventable diseases having three subordinate divisions, as a division of epidemiology, a division of tuberculosis, and a division of venereal diseases. At the head of the bureau of communicable or preventable diseases, there would be a director who would be responsible for the overhead supervision of the work of the subordinate divisions. Each of such divisions should be in charge of a chief medical officer with special technical skill in his particular field. The reasons for giving tuberculosis and venereal diseases recognition as special divisions of the bureau of communicable or preventable diseases have been indicated in the discussion of these diseases in preceding sections. Since, however, the principles of communicable disease prevention and control are the same for all diseases, it is desirable that there be one directing head in charge of all activities to this end.

The field inspection and supervision of communicable diseases are, as we have noted, closely related to other inspectional activities in child hygiene. In the organization of the bureau of preventable diseases, provision would naturally be made for utilizing school medical inspectors and nurses as far as it is possible to do so without interference with routine school work. Each of the three divisions of the bureau of communicable or preventable diseases, the division of epidemiology, the division of tuberculosis, and the division of venereal diseases, should have in addition to a medical chief of division, at least one or more physician inspectors for special field service, which could not well be done by child hygiene medical inspectors or nurses. There should be a sufficient number of clerks to take care of office records, telephone communications, correspondence, etc. For an outline of the organization of a bureau of communicable diseases in a city of 100,000 population along the lines indicated, the reader is referred to an "Ideal Health Department for a City of 100,000" in the Report of the Committee on Municipal Health Department Practice, to which reference has already been made.

One of the most vital parts of a good organization for communicable disease work is a competent office force. If there is such a force, it will be possible to keep field inspectors in the field where they belong. They should get their directions from the clerk in the office, make their reports "on the spot" in the field, and spend no more time in the office than is necessary for conference with their superiors.

The equipment of a bureau of communicable diseases should include, first of all, automobiles for the chiefs of the various divisions and their special inspectors or investigators. Promptness of investigation is the essence of good communicable disease work, and one inspector in an automobile can cover a greater territory more promptly than three or four inspectors on foot. Office equipment apart from the usual complement of office furniture, consists only in good files for records, ample telephone service, and large size city maps on which the location of cases of disease may be "spotted." Colored pins are commonly used for this purpose, the different colors indicating different diseases.

Although the public health laboratory, the communicable disease hospital, and the special clinics for tuberculosis, venereal diseases, and other diseases are essential features of the prevention program, we shall not consider their organization and management here. The

public health laboratory is ordinarily recognized as an independent unit and we shall so consider it in a subsequent chapter. The communicable disease hospital, the clinics, and other treatment services will be dealt with in Part III as elements of the general service of government for the treatment of disease.

CHAPTER X

CHILD HYGIENE AND PUBLIC HEALTH NURSING

In no field of municipal health work is expenditure more quickly productive than in the protection and promotion of child health, nor is there any part of the municipal health program to which the public gives more generous support and coöperation. For these reasons, there has been during the last quarter century a most remarkable increase of municipal health budgets for child hygiene and an extension of official health jurisdiction over many phases of child life which prior to this period had been regarded as outside the official domain. Among the private philanthropic organizations also, there has been a similar but even more remarkable development of child health services and, in this country, particularly, an outpouring of money and effort for unofficial services unparalleled in the experience of any nation at any time. Hundreds of millions are spent annually in this country by national, state, local, and private agencies in this cause and new agencies, official and unofficial, spring up almost over night.

Fifty years ago child hygiene was practically unrecognized as a distinct field of community health service. Small special hospitals for children had been established under private auspices in Philadelphia, New York, Boston, and Chicago, and in a half dozen cities there were day nurseries, also under private management, where working mothers might leave their children to be cared for while they were at work. The Society for the Prevention of Cruelty to Children came into existence in 1875 and the creation of this semi-official agency may perhaps be regarded as the first recognition of official responsibility for child health and welfare. An event of even greater importance in its effect upon public health administration was the enactment by the New York State legislature in 1879, of a law requiring the board of estimate and apportionment of New York City to appropriate $10,000 annually for child health work. This fund, known as the tenement house fund, was utilized by the city health department to maintain a special

"summer corps" of physicians and nurses to visit and treat sick tenement house babies and otherwise aid in checking the appalling increase of infant mortality in the congested districts of the city. It was in this small beginning of municipal health service for the prevention of infant mortality and in the official recognition by the government of its responsibility for it that the modern child hygiene program of municipal health departments found its real source.

In the twenty years following 1879, when the problem of reduction of infant mortality first received official consideration, many progressive measures for child health were initiated and rapidly extended in several of the larger cities of the country. New York City began medical inspection of school children in 1892 and her lead was quickly followed by Chicago, Philadelphia, Boston, and other large cities. In 1893, Nathan Straus established pasteurized milk stations for babies in New York City and began a new health enterprise, the importance of which was promptly recognized by health officials throughout the country. Health departments in many cities established baby milk stations under their own control or coöperated in the development of such enterprises under private control. Other important activities, such as the prenatal instruction and supervision of prospective mothers, the protection of children in employment, the inspection of children's homes and day nurseries, the supervision of midwives, and the extension of health, educational, and recreational facilities for children, were rapidly taken up by official and unofficial health bodies, but in so far as municipal health departments were concerned, no comprehensive, centrally directed program covering all phases of child life took form until 1908, when the first division of child hygiene of a municipal health department was established in New York City.

At this time, health administration in the City of New York was a complex affair. Under the charter of consolidation of 1897, the greater city of New York was made up of a large number of adjacent communities which had previously enjoyed complete independence. The charter of consolidation permitted these communities a certain measure of autonomy in health matters. The necessity of having a well organized, centrally controlled child health service which could develop standards of procedure and uniformity of practice for all of these areas was apparent, but little was accomplished to bring order out of chaos until Dr. Thomas Darlington became health commissioner of the greater

city in 1904. From the first he gave his attention particularly to the problem of child health betterment with the purpose of developing a division of child hygiene as a major trait of the health department's organization which would bring together under single-headed direction, the many activities carried on in the various city boroughs. Following a study by the New York Bureau of Municipal Research in 1907-1908 of the existing plan of child health service in the boroughs, Dr. Darlington approved the recommendation of this bureau that a division of child hygiene be established and this new division was created in 1908. Dr. S. Josephine Baker was made the first chief of the new division, and under her skilled guidance a new era in municipal health service was begun. Dr. Baker's name is one to be remembered.

With respect to the origin and purpose of this new division of the official health organization, Dr. Baker says:

> The division of child hygiene was created by action of the board of health on August 19, 1908, after preliminary studies had been made to determine the wisdom of such a procedure. It ranks as the first division established under municipal control to deal with the health of children from birth to legal working age, in so far as a municipal health department may regulate and control the conditions of child life and health.
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> Prior to the establishment of the division of child hygiene, the functions relating to child life and health had been performed in part by several quite independent divisions of the department of health. Thus, the medical inspection of school children, inaugurated in 1897, was in charge of the division of contagious diseases, because the exclusion for contagion formed at first a considerable part of this inspection. The work of issuing employment certificates was under the charge of the division of sanitary inspection because that division also had charge of inspecting mercantile establishments. The supervision of women caring for foundlings was under the care of the assistant sanitary superintendent, the supervision of midwives was in charge of the general medical officer.
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> Furthermore, each of the five boroughs which had become amalgamated by consolidation into the Greater City of New York pursued each of the branches of work enumerated in its own way quite independently of the other boroughs.
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> The division of child hygiene is, therefore, a result of the process of evolution. Its component parts had existed, nearly all of them, for a number of years, and had gained deserved credit, each in its own field and in its own way. But each had pursued its independent course, and there were lacking that unity of purpose, that coördina-

tion of methods which are necessary for the attainment of the best results in any broadly laid out field of public health work.[1]

Similar divisions of child hygiene promptly sprang up in city and state health departments throughout the country and Dr. Baker's program was generally accepted as the model. Following a later general reorganization of the New York City health department, the division of child hygiene became one of several "bureaus" and has since been continued under the name bureau of child hygiene. Such bureaus or divisions of child hygiene are to-day recognized as essential to efficient state and municipal health service, and there are few cities or states in which provision has not yet been made for coördinated effort in this direction.

The Scope of a Program of Child Hygiene

For practical administrative purposes the responsibility of a municipal health department may be considered to begin with the child in embryo and end with the completion of compulsory school attendance. In most states the minimum age at which children are permitted to leave school for employment is fourteen years, although state child labor laws generally permit exceptions to the fourteen year minimum, depending upon the nature of employment, the physical and mental development of the child, and local conditions of employment. When the child has entered employment, the control of municipal health authorities over his future course is naturally limited mainly to those general measures of health protection which are of common application to all members of the community. The general laws governing hours of labor, sanitation of places of employment, etc., are as a rule administered by state agencies rather than municipal agencies. The activities of municipal health departments are not, therefore, extended to cover fully the supervision of the health of adult or child workers, except in a few cities where local conditions make special municipal industrial health services desirable.

We may regard the sphere of child hygiene work, then, as limited mainly to the first fourteen or fifteen years of child life. In this period there are two major groups of activities, the procedures of which are determined largely by the age of the child.

[1] S. Josephine Baker, *The Division of Child Hygiene of the Department of Health of New York City*, Monograph Series No. 4, Department of Health of the City of New York, August, 1913.

The first group of activities has to do with the protection of child health from the earliest period of embryonic life up to the time of school entrance. The second group of activities concerns those problems of child health which are directly related to school environment and school training. The extent to which the varied activities represented in these two groups are developed and carried on by municipal health departments depends considerably on local circumstances. As already stated, the field of child hygiene is one in which private or unofficial agencies are extremely active and many municipal health departments have been content to leave to such private agencies a large share of the responsibility of child health protection in the preschool age period. In many cities, also, school health work has been carried on by educational authorities either because of certain local influences or because the state law so requires. It is, however, the consensus of opinion among health workers, at least, that an adequate child hygiene service can best be developed where there is undivided responsibility for the management of all of the various activities falling within this field. In the opinion of the majority of health authorities, such management is best provided by the municipal health officer if he has sufficient funds and staff for the work.

The argument for such centralization of control of child hygiene work in health departments is briefly that since the health authority is legally responsible for the prevention and control of disease in his community, his efficiency in such work is impaired unless he has authority also over other activities for child health protection, which are so closely related to disease prevention and control. The health officer is legally responsible for registration of births, sickness, and death in most cities; supervision of midwifery practice in those states requiring such supervision is commonly made his duty; registration and control of communicable diseases in all cities is mandatory upon the health officer, and where efficient child labor legislation is in force, certification of the health of children prior to employment is also his duty. In view, therefore, of the many mandatory child health activities devolving upon the health officer at all periods of child life, his management of all other supplementary and complementary services seems fitting, whatever may be the practical objections to such plan. Furthermore, it is highly desirable in the interest of community health that the public be taught to look to the health officer for leadership and to depend for its health protection upon him rather than upon agencies with-

out legal responsibility or having only partial or indirect interest in public health.

In any case, whatever may be the responsibility of the health officer for management of the child health program, the following activities should be carried on:

1. Prenatal supervision and instruction of pregnant mothers in their homes and at special prenatal clinics.

2. Registration, instruction, and supervision of midwife attendants at birth in order to prevent the dangers attendant at birth by incompetent management of it.

3. Prompt visitation of new-born infants in order that parents may be apprised of the health department's interest in child care and aided if necessary in providing adequately for such care.

4. Continued follow-up of children in the preschool age period and their health supervision in their homes, in special clinics and institutions, and the furnishing of such medical or other relief at public expense as may be required.

5. Periodic examination of school children to detect disease and physical and mental defects, and provision for their treatment if necessary at public expense.

6. Health examination of children applying for working papers in order to protect them against employment in places or under conditions detrimental to their health.

7. Education of parents and children in personal and public hygiene with particular emphasis on child health needs.

A Summary of Health Problems of Early Infancy and Preschool Age Period

In the chapter on vital statistics the "infant mortality rate" has been defined and its value and use as an index to municipal health efficiency described. It will be recalled that the infant mortality rate is the number of deaths of infants under one year of age for each 1,000 reported births. Of all deaths of infants under one year, the greatest number occur in the first few days or weeks of life. This is due mainly to the fact that the infant at birth enters a new and quite different stage of existence to which it must become adjusted. All of its organs are undergoing rapid and extraordinary changes to meet the new conditions encountered and its resistance to harmful influences has not yet been fully established. Not alone that, but it may enter this new stage of existence with its normal vitality impaired because of ill health or exhaustion

of the mother, because of injury received in embryo or at birth as the result of some accident of pregnancy or labor, or lack of competent attendance at birth and proper care of the infant in its first hours of independent existence.

It is obvious that prevention of high infant mortality is dependent mainly upon the establishment of health protective measures as early in pregnancy as possible and the continuation of such protective measures at birth and on through early infancy. But even after the early and more serious dangers are past, other hazards must be guarded against. The communicable diseases take their heaviest toll of small children; disorders of diet are common and fatal to many; physical defects appear which, if uncorrected, predispose to disease and may become permanent handicaps to the child in school and in later life. So further health protective measures must be instituted and the contact established at the beginning of life must be continued so that there will be no gaps in health supervision. This is particularly necessary in the years just prior to school entrance, for during this period the child has usually less health supervision than in early infancy or later in school life. From the point of view of administrative procedure we shall regard the preschool age period as comprising the entire period from the very beginning of life to school entrance, although it is customary to speak of the preschool age period as referring chiefly to the years between infancy and school entrance, *i.e.,* from the end of the second year to the fifth or sixth year.

Prenatal Supervision of Expectant Mothers

Among the wealthy and well-to-do it is customary for women to consult a physician early in pregnancy and to retain him for such medical advice and treatment as may be necessary before, during, and after the birth of the child. This means, of course, an expenditure for medical service which many families cannot afford, although continuing medical supervision may be even more needed for the mother of such a family than for her well-to-do neighbor. So it happens that many women receive little attention until late in pregnancy or at the beginning of labor. A doctor or midwife may then be called to attend the patient and dismissed as soon as the emergency is over. But the dangers to mother and child throughout pregnancy are many and cannot be met adequately unless the mother is properly advised and cared for during the entire period. Illness or exhaustion of the mother may result

in such impairment of vitality of mother and child that the life of either or both may be endangered in labor. The mother may suffer from physical defects in bodily structure which make normal birth impossible and compel resort to operative procedures which inevitably increase the risk to both mother and child. If, as is common, particularly among the foreign born and negroes, the family calls a midwife instead of a physician to attend the mother at birth, necessary operative procedures may be so delayed, or if undertaken (illegally) by the midwife, so incompetently performed that the health of mother or child may be seriously impaired.

The results of inadequate supervision of the expectant mother are clearly reflected in the vital statistics records. Because of the termination of pregnancy before the proper time, through accident or injury to the mother, or through interference with pregnancy, the life of the fetus may be destroyed and not infrequently the mother loses her life. The child may be born living before full time and because of its lowered vitality it may appear on the death records as a premature birth; or it may be born dead, in which case it is reported as a stillbirth. In many cities the deaths charged to premature birth and other causes due to the lack of proper protection of the mother during pregnancy or incompetent attendance at birth are equal to the number of deaths resulting from other causes during the first year of child life.

The establishment of a system of health supervision of expectant mothers is properly a function of a municipal health agency. In many cities, however, this phase of child health work is left to private health organizations. In the judgment of the writer, it is far better for the official health agency to take the responsibility for prenatal health work, since it enables the health officer and his assistants to establish a friendly contact with the family at the very beginning of child life. The helpful advice and aid given the mother during pregnancy go far to promote the relations which the health department must maintain with the family later on in the child's life. The usual practice, whether prenatal work is carried on by the health department or by private agencies, is to establish special clinics for pregnant women not able to employ a private physician. For those who are not able to attend clinics, a home visiting nursing service is useful. At prenatal clinics women are given physical examinations by physicians; treatment is prescribed and provided if necessary; advice is given them on their own diet, clothing, employment, recreation, etc., and how to

care for their babies. Arrangements are made for their confinement at home or in hospital as may be necessary, and if other relief is required, the services of municipal or private charitable agencies are called upon.

The Supervision of Midwives

In all of our largest cities and in many of our smaller ones, the supervision of midwives is a factor of great importance in preventing infant deaths. The midwife instead of the doctor is sought as the birth attendant by foreign-born families and their descendents and also by negroes of the south, particularly, because it is customary and because midwives charge less than physicians. In continental Europe, the majority of midwives are well trained, most of them graduates of good schools of midwifery. In this country there are relatively few well-trained midwives, except those who have been trained abroad or in the few scattered schools in some of the larger cities. Among the negroes, midwives of their own race are almost wholly untrained.

In the majority of the states, laws and regulations governing the registration and practice of midwives are quite inadequate to prevent the practice of ignorant and incompetent midwives and the consequent abuses which so often arise. Except in a few states, notably New Jersey, where midwife registration and inspection are provided by the bureau of child hygiene of the state health department, responsibility for such regulation of their practice as may be permitted by law is commonly vested in the local health authority of the community in which the midwife has her practice. In New Jersey, because of the state's small area and the existence of many large communities in close contact, it was found that state supervision of midwives was necessary because of the inequalities of local health administration, and the ease with which midwives can extend their practice from one community to another.

Midwives in all states are supposed to limit their practice to attendance on cases of normal labor, that is, those not requiring special medicinal or operative treatment. If the midwife finds that the patient requires medical or surgical treatment or that labor must be assisted artificially, it is her duty to call a physician. But in many communities where local health authorities are not given sufficient authority to inspect and supervise midwives, or have not taken advantage of their opportunities under the law to

provide against the dangers of improper and illegal midwife practice, midwives do very much as they please. The need of skilled midwives is conceded by all health officials, but it is absolutely impossible to prevent improper and illegal acts by midwives except where there is a proper system of state or local supervision of their work. In Wilmington, Delaware, where there was at the time of the writer's survey an extremely high infant mortality, examination of the health department's procedure in control of midwives indicated not only the need for more adequate state legislation on the subject, but the need also of more intelligent administration of existing law. Quoting from the report of this survey:

> There were at the time of this study 57 midwives and 123 physicians practicing in Wilmington, and the 57 midwives attended at birth about one-fourth of the babies of the city. Many of these midwives are ignorant and dirty, many cannot read or write, and all are entirely unsupervised. Whatever may be the attitude of the state with reference to their practice, it is decidedly a responsibility of the citizens of Wilmington to see that better control is exercised over them. If there are 57 midwives known to be practicing, it is quite probable that there are some who are practicing secretly.
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> In the present system of registering midwives in the board of health all manner of serious defects are evident. The sole requirement is that they be registered. No one vouches for their honesty or ability, no test is required to show their competency, and no examination is made of their methods and equipment. Even the mere registration of their names has no value. It is assumed that one of the purposes of registering midwives is to have the signature of each midwife available for comparison with her signature on the birth certificate, but since there are so many that cannot read or write, it has been customary for the clerk in the health department merely to write the names of such midwives in the register in her own hand. Under this procedure there is absolutely nothing to prevent a midwife who is not even registered, from signing some other midwife's name to the birth return. It is not charged that this has been done, but it is quite possible since there is no way of determining whether the signature on the birth certificate is the signature of a registered midwife.
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> Without an adequate state law requiring for midwife practice definite standards of education, training, and experience, control of midwives will always be ineffective, but a beginning can be made even without such law. Instead of the book register which was very

carelessly kept and contained no information about midwives except their names and addresses, a card record should be kept of the facts about each one. The card should contain the name of the midwife, written by the midwife herself, if she can write, her address, experience, appearance as to cleanliness and health, ability to speak or write the English language, color, nationality, and such other information as can be obtained from the midwife or from others relative to her practice. If visiting nurses are employed by the health department, it should be their duty in the course of their work to secure all possible information regarding midwives and their methods. In this way definite information as to their activities can be made available to show the need for legislation.

As a further step in providing information on which to base legislation, birth records should be analyzed currently to show how many births were attended by midwives; how many infants dying during the first year of life were attended at birth by midwives; how many stillbirths and premature births were charged against midwives; and to what extent midwives were responsible for failure to report births promptly and in compliance with the law.

All these things can be done without any further authorization in law than is now enjoyed. It is only necessary to give some intelligent thought to the matter to establish, even under the present inadequate law, a measure at least of control of the midwife situation.[2]

In Denver, Colorado, where the inadequacy of supervision of midwives was also a most serious handicap to the prevention of infant deaths and other abuses, the following situation was found:

Midwives are not required to register at the city health office, nor do the city health authorities exercise any supervision over them, although section 969 of article 4 of the revised ordinances states that "Every physician or midwife practicing his or her profession in the city or county is required to register his or her name, place of residence, and office in a book to be kept for that purpose in the office of the health commissioner." The state health law declares that midwives shall be registered with the state board of health. Inquiry, however, elicited the fact that only four midwives were so registered, and yet if this is a complete registration of midwives, four midwives are delivering approximately 14 per cent of the babies born in Denver. In the eleventh biennial report of the state board of health the following statement is found in the report of the medical inspector of lying-in hospitals: "Throughout the state and more particularly in Denver were numerous lying-in institutions,

[2] New York Bureau of Municipal Research, *Survey of the Government of the City of Wilmington, Delaware,* 1919 (typewritten), pp. 308-310.

important and unimportant, licensed and unlicensed. Some of these places were legitimate and honorable, others were hotbeds of crime. Not all, but many, of these places were conducted by self-styled 'midwives.' In many instances the midwife in charge had a secret arrangement with some outside physician to assist her in crime. Some in disguise were using the daily papers to advertise their business which was chiefly the production of abortions." [3]

Efficient supervision of midwives by local health authorities depends upon having, first, a good state law governing their registration for practice on the basis of proper test or examination of their qualifications, and second, upon the maintenance by local health authorities of a competent system of midwife inspection and supervision. Assuming that the local health authority has been given power under the state law to provide for such control of midwives, the measures necessary to this end are:

1. Local registration of all midwives at the health office. Such registration should include as a minimum the name, age, residence, educational and experience qualifications, and other facts about her which may be obtained by interview, including her ability to read and write English. She should be required in all cases to sign her name to the registry, if she is able to do so, in order that her signature shall be available for comparison with that on birth certificates filed by her.

2. Periodic inspection of the midwife's place of business and equipment in order to ensure that she has not available for use any of the drugs or surgical equipment, the use of which is prohibited. A complete record should be kept in the health office of reports of all investigations of midwife practice. Such investigations are preferably made by trained nurses of the bureau of child hygiene.

3. Provision of facilities for the training of midwives so that if the state law is not adequate to protect the community against the licensing of unskilled and ignorant midwives, a reasonable measure of protection may be guaranteed, through the encouragement of higher standards and higher ideals among them.

In Rochester, New York, registration of midwife practice has been highly effective for the past thirty years by virtue of a special state law applying only to that city. This law and its application

[3] New York Bureau of Municipal Research, *Report on a Survey of Certain Departments of the Government of the City and County of Denver, Colorado,* 1914 (printed), p. 47.

illustrate strikingly what can be accomplished by a community under good health leadership.

The board of examiners of midwives in Rochester was created by a special act of the state legislature in 1895. The board consists of three members, two of whom are practicing physicians appointed by the mayor, the third member being the health officer of the city. The board is authorized to make and enforce such rules and regulations as may be necessary in control of the practice of midwifery, and to examine and license candidates for midwife practice. For this service the act authorizes compensation for members of the board, except the health officer, at the rate of $10 a day for each day necessarily given to the performance of their duties. The law specifies also that the examiners shall meet on the first Tuesdays of October and April of each year and on such other days as they may appoint.

The original board of examiners, consisting of two practicing physicians and the health officer, still remains unchanged as to personnel, and there can be no question that it is due to the firm and far-sighted policy adopted by this board at its first meeting that Rochester occupies her present enviable position among cities with respect to the regulation of midwife practice. There were at the time of the creation of the board about thirty midwives in the city entirely unsupervised and uncontrolled. In order that these midwives might be given a fair chance to demonstrate their competence to practice, the board decided at its second meeting on August 18, 1895, to give a course of lectures to midwives on the subject of obstetrical practice. This was probably the first organized effort on the part of municipal health authorities in this country to conduct a school for midwives. Six lectures in all were given in English and German, and at the completion of the course a review was held for the twenty-eight midwives who attended. Following this the midwives were given a thorough examination and twenty who demonstrated their competence in this examination were passed and licensed; two were rejected, and six were held for further examination.

At the first examination the candidates were examined in their own languages through interpreters. Not only was this a difficult procedure, but it was found later on, that unless the midwife was known to speak English, it was difficult to get the proper coöperation from her in her practice. If she was charged with violation of the law she would take refuge in her professed inability to understand English, and it was therefore impossible in certain instances to make a thorough investigation of the facts of the alleged violation. In 1906, the board unanimously adopted a resolution to the effect that thereafter candidates would be examined in English only.

The examination of the minutes of the board shows that persistent and strenuous effort has been made to punish violators of the law and to eliminate from the practice of midwifery the unclean and inefficient midwives who are a menace to the entire community. As a result there are but nine midwives now registered as practicing in the city, all of whom are known and vouched for by the examining board. The health officer states that there are in all probability a number of unlicensed midwives who do not sign birth certificates themselves, but get physicians to do so for them. It is impossible to detect such violation unless the action of the unofficial midwife results in the sickness or death of the patient or child, and complaint is made against the midwife on this account. In such cases thorough investigation is made by the board of examiners, which sits as a court of inquiry. The board is given power under the act creating it to recommend to the mayor of the city the revoking of licenses of midwives adjudged guilty of violation of the law, and the mayor is given power to revoke such licenses. In addition to this penalty, any person who violates the regulations of the board is guilty of a misdemeanor and on conviction may be fined not less than $50 or more than $100.[4]

Birth and Death Records and the Child Health Program

We have considered in a previous chapter on vital statistics the general importance to health control of complete and accurate statistics of births and deaths. The special significance of birth and death records in the development of child health services requires, however, further explanation.

The birth certificate ordinarily represents the first official recognition of child life, and the facts about birth there set forth make it possible for the health officer to define his program for the prevention of infant deaths. The certificate of birth tells him where and when the child was born; whether it was a legitimate or illegitimate birth; who its parents were, and their ages, nationality, color, and occupation; the total children born to the mother and the number of them now living. It also gives the name and address of the doctor or midwife attendant at birth, whether or not the child was born alive, and, in some states, the measures adopted by doctor or midwife for prevention of infection of the eyes of the new-born. The analysis of these facts about birth is of considerable importance in determining the probable need for health department coöperation with the attending physician or midwife and the family. Every item on the birth certificate tells the health

[4] New York Bureau of Municipal Research, *The Government of the City of Rochester, New York*, 1915 (printed), pp. 358-359.

officer something about the home and circumstances of the family. The address of the home gives him the clue to home environment; the facts about age, nationality, color, and occupation of parents help to interpret the family's social and economic status; the number of previous children and whether they are living or dead have a special significance with respect to the health of the new baby. The legitimacy or illegitimacy of the child is a factor particularly to be noted, for the illegitimate child is frequently not wanted and, therefore, in need of greater protection. Whether the birth attendant was a physician or midwife is a fact which determines somewhat future procedure of official supervision.

Careful analysis of death records of infants is also necessary. The death record contains the essential facts about the place of death, its cause, and other circumstances about it, and it gives a clue to the home environment and character of the family. It is extremely important for the health officer to determine by such analysis the rates of deaths of infants according to causes, location in the city, age, and also by nationality, color, occupation of parents, attendance by physicians, etc. If infant death rates are higher in certain parts of the city than in other parts, he should find out why. If many infants are dying from gastrointestinal diseases, for example, investigation of the milk supply may disclose the reason for it. If the death rates are higher for colored babies than white babies, the fact should be known and the causes thoroughly studied. If more babies die in the families of working mothers, this fact is of prime importance in determining the need of day nurseries, and other community aids to such mothers.

The most important fact about deaths of infants is, of course, the cause of death. We have already commented on inadequate and improper prenatal and obstetrical care as a major cause of infant deaths. Next, perhaps, in importance as causes of death, are the digestive disorders common to infants, particularly in the first two years of life. These causes are for statistical purposes under the head of "diarrhea and enteritis—under 2 years." The reason why the diseases of this particular group take such heavy toll of infants under two years is that milk which is their chief item of diet is so easily rendered unfit for them. If mothers' milk is not available or suitable, cows' milk must be substituted, and unless the community's milk supply is thoroughly protected, the infant may be subjected to serious health hazards. There are other factors, of course, in adjusting the care of infants to their

peculiar needs which must be carefully weighed by attendant doctors and nurses, but when good medical or nursing advice is not available to mothers, faulty diet is likely to be responsible for a great deal of infant sickness.

It is of special importance in the analysis of death records to note that the deaths of infants under two years from "diarrhea and enteritis" show a rapid increase in the warm months, June, July, August, and September. This is partly because in these months the bacteria which are present normally in milk, as well as the bacteria of disease which may be present, multiply rapidly if the milk is not kept at low temperatures. A few hours' exposure of milk at summer temperature on the home door step or in the house may result in a dangerous multiplication of bacteria and a serious contamination of the milk for infant use. A marked increase of infant deaths from gastroenteritis puts the health officer on his guard as indicating, among other things, the need for special study of methods of production and handling of milk. It suggests also the need of educational activities for the instruction of parents in home care of milk and its adaptation to infant diet.

Health Supervision After Birth and in Early Infancy

After the birth of the child has been officially recorded and all the circumstances of birth noted for analysis, the next step in procedure is the prompt visitation of the parents of the new-born infant by a trained nurse of the health department. If the birth was attended by a physician, the physician should first be consulted and the nurse's services limited to those approved by the private physician. In many instances when a physician is in attendance, the nurse's aid will not be required, but in others the attending physician will welcome her coöperation, which should be given without regard to the economic status of the family. If no physician was in attendance on the birth of the child, the health nurse should go immediately to the home and offer such advice and aid as may be needed and wanted by the family. A competent, tactful, trained nurse can usually gain admission to the home at such a time and, if she is helpful and not merely critical, her influence for health in the family is likely to continue beyond the immediate necessity, and produce results not obtainable in any other way. In the chapter on vital statistics, the procedure of notifying parents immediately upon registration of birth was com-

mented upon as an effective aid to better registration of births. In some cities it is the practice to mail such notices or certificates of registration to the parents, but better practice is to have them delivered at the home by the health nurse. This furnishes an excuse for the nurse's first visit, and opens the way to friendly relationship with the family, if such contact has not already been established in the prenatal period.

The first two years of child life are by all odds the most critical. Mention has been made of the significance of diet during this period. The natural food of infants is milk and mothers' milk is by all odds preferred. The encouragement of breast feeding is an important part of the health nurse's duties. If the mother does not nurse her baby, prevention of digestive disorders due to improper modification of cows' milk or the use of unclean cows' milk, or other improper foods calls for more insistent medical and nursing supervision in the home. It is the opinion of the most competent specialists in infant care that if breast feeding were universal, deaths of infants from diarrheal diseases could be greatly reduced. All infants up to six months of age ought to have mothers' milk exclusively, if possible. The mortality of bottle fed babies is from eight to nine times as great as that of breast fed babies. In many cities, it is the practice of public health nurses to secure breast milk from healthy mothers having an excess of milk, for distribution among less fortunate mothers.

The importance of proper regulation of the milk supply in the prevention of infant sickness and death is often exaggerated, but it is none the less an important part of the child health protection service. It is of little value, however, for the health department to guarantee a clean, wholesome milk supply if the infant's health is likely to be endangered through improper care of milk in the household, or improper use of it in infant feeding. So, many health departments have found it desirable to establish special clinics where mothers may bring their infants for periodic examination and where they themselves may be advised how to care for milk and how to use it to best advantage in infant feeding. Ten or fifteen years ago, there were many "infants' milk stations" where milk was prepared for infant feeding and sold or given to mothers. These milk distributing stations have, however, largely been done away with and emphasis is now placed on the health education of mothers in all matters of infant care. Much of this instruction can, of course, be given mothers in their homes. It is,

however, more economical of time and money to provide for their instruction in classes at infant clinics, where all facilities for examination and weighing of infants are available. The clinic class also helps in developing the common interest of mothers in child health and, if well organized and conducted, may stimulate greatly a friendly rivalry among them for better babies and better baby care in all respects.

Health Supervision Prior to School Entrance

While municipal health activities for the protection of the health of children, in early infancy and during school life, have developed rapidly in almost all American cities during the past twenty years, it has been only in the past ten years that attention has been especially directed to the health supervision of children during the three or four years immediately preceding school entrance. During the first two years of life the child is kept at home and its health protection is secured ordinarily by the very simple home measures of "good care, good fare, and good air," and the advice of a competent physician. But as the child grows older, new dangers beset it. The teeth begin to need special attention. Tonsils and adenoids which may have caused no trouble in early infancy, may become diseased and seriously handicap the growth of the child's body and mind. The increase of the child's contacts outside the home and the wider range of its activities expose it to greater dangers from infectious diseases, and defects of body function and structure may appear which unless promptly corrected may produce serious physical or mental impairment. The physical and mental examinations of many children at school entrance show clearly the need for continuing health supervision of the child during this important preschool period.

If prenatal and postnatal work is thoroughly done and contact with all possible mothers and infants properly established, continuation of the preschool health service can be readily provided in clinics to which parents may bring their children for periodic examination and advice on the correction of physical defects. The great advantage of this type of work is not alone that it permits the prompt correction of physical defects which may later become greater and more difficult to correct, but also that it lessens the amount of health supervision required later in school life.

In the period just before school entrance when the child is at large and in close contact with other children the contagious dis-

eases of childhood take a heavy toll. Special effort should be made, therefore, to encourage parents to take advantage of immunization of their children, prior to school entrance, by vaccination against the contagious diseases, diphtheria, scarlet fever, and smallpox. It is, of course, easier to secure parental coöperation in providing such protection after the child enters school because parents think that children are more frequently exposed to contagious diseases in school, although the very fact of their being in school is in itself a certain safeguard. Children probably contract contagious diseases as frequently from contacts outside the school as in it, and their contacts outside the school are likely to be more direct and intimate. The more children immunized against diphtheria, scarlet fever, and smallpox before school entrance, the better for the children themselves and for the public.

Health Supervision of Infants' Homes and Day Nurseries

In most of the large cities and many of the smaller ones, boarding homes for infants, day nurseries, and other institutions for the custodial care of small children have been established either under the auspices of private philanthropic agencies, or as commercial enterprises under the management of private individuals. Among the latter institutions, investigations have so frequently disclosed serious abuses that health authorities have found it necessary to provide for registration and periodic inspection of all such institutions. As a basis for determining the fitness of any institution of this character to care for children, some states have adopted legislation defining specifically the responsibility of the local health authority in the matter, and setting up certain standards of plant, equipment, medical supervision, and sanitary facilities for these institutions. Even when no special state law has been enacted which directly confers upon local health authorities responsibility for licensing and inspecting these institutions, the general provisions of public health laws are usually sufficient to permit the enactment of local ordinances requiring their registration and inspection by local health agents. When legal provision has been made for their licensing, a preliminary inspection should be made of the institution and its management, and licenses granted only to those capable of maintaining approved standards.

Without authority to issue and revoke licenses of children's boarding homes and day nurseries, the health officer is considerably handicapped in preventing improper practices, particularly in insti-

tutions conducted for profit by private individuals. When there is positive evidence of wrongdoing or exposure of children to health dangers, the health officer should have power to take appropriate action, but many times such evidence does not come to light except through the reports of communicable disease or through the records of death. Unwanted children, illegitimate or otherwise, are frequently placed in boarding homes because their parents wish to be relieved of their own responsibility for caring for them. If health inspection of such institutions waits upon complaints of improper practices, inspection is not likely to be frequent enough to guarantee the children's protection against grave health dangers. The mortality among small children in institutions is extremely high as compared with the mortality of infants in private homes, even where the former are given the best care possible under the circumstances. This is not necessarily because of any failure on the part of the institution to maintain high standards of service, but merely because, as Dr. S. Josephine Baker remarks: "Babies cannot be raised wholesale. The most important factor in the welfare of a baby is his mother . . . The evidence is overwhelming that without this mothering, babies have little chance for life or health."

If the baby cannot have the advantages of its own mother's care, the next best thing is to provide for its care by a foster mother, not in an institution, but in a real home, in all that the word implies. If this is impossible, as it is in many instances, good institutional care must be provided, and it is the duty of health officers to do all that they can to make good care possible for all children who must be condemned to institutional life.

School Health Work and Its Development

As already noted, public medical inspection of school children was begun in New York City in 1892, when a single medical school inspector was appointed to the city health department. The first comprehensive program of public school health inspection was, however, inaugurated by the city of Boston in 1894, with the appointment of fifty physicians to inspect children for contagious diseases in the fifty districts of the city. Chicago in 1895 followed the lead of Boston and New York, and New York again, not to be outdone, expanded its school medical service to 134 physicians in 1897. Philadelphia adopted a similar plan in 1898, and other large cities later.

The next step of prime importance was again taken by New York City when it appointed a staff of school nurses to assist school physicians. As soon as the doctors had got well into their work, they discovered that many children were suffering from serious physical defects. So in 1905, New York City began with its school doctors and nurses a systematic periodic examination of all school children to detect physical defects and a home "follow up" to secure their correction. The next year, 1906, Massachusetts passed a state act requiring every city and town to establish and maintain a school medical inspection system with competent physicians to examine children for contagious diseases and physical defects. By 1910 systems of school medical inspection including examinations for disease and physical defect had been established in a hundred or more of the larger cities of the country, not including those of Massachusetts.

In order to deal with the large number of school children found to have physical defects, special clinics for school children came into being. New York City established at public expense five school clinics for the treatment of diseased tonsils and adenoids in 1912, but discontinued them in 1915 because of criticism. Other cities have established similar special children's clinics either in the schools under the director of health or educational authorities or in connection with the dispensaries of public or private hospitals. Although there has been some question of the desirability of maintaining special free clinics for school children at public expense because of alleged abuse of them by parents able to pay for treatment, there can be no question but that such free clinics ought to be available in every large community. If these facilities are not provided either at public expense or privately, many parents cannot be induced to provide treatment for disorders which they regard as of little consequence.

In any event much can be accomplished and is accomplished by systematic periodic examination of school children to detect disease and defect and by personal visits to homes to urge and help parents to provide treatment. The great advantage of school health work is that here for the first time during child life practically all children are gathered together, under dicipline and control, and systematic health education can be made a regular feature of the school curriculum.

There should be the closest coöperation between health authorities and educational authorities in the development of the school

health program, but unfortunately such coöperation has been conspicuous by its absence in many places. The health officials argue that the administration of the school health service should be in their hands because of its essential health significance, and the educational authorities have insisted with equal firmness that school health work falls properly within their administrative domain, because it is so largely educational in character. So it happens that in some cities the school health program is controlled by health departments and in others by departments of education. The tendency in state legislation is to put the responsibility for this work upon departments of education, largely because, in the small communities and rural districts, educational organization is not only better developed than health organization but better financed.

In so far as control of contagious diseases is concerned, the health officer is by law held accountable for establishing such rules and regulations governing school attendance and dismissal from school as may be necessary. But the detection of communicable diseases and the physical examination of children for the detection of physical defects can be done as well by a corps of doctors and nurses in the department of education as by a similar corps of doctors in the department of health. After all it really matters little where administrative responsibility for medical inspection of school children is lodged, provided there is close coöperation between health and educational departments. The question is one that must be decided largely by local conditions and local needs, with a view to efficiency of service and economy in the use of public funds. In the larger cities where health departments are well organized and financed, school health work can, to advantage, be included with other child health activities under health department control. In smaller communities where funds for health service are limited and the health department consists mainly of the health officer and one or two assistants, it is probable that school health work will be better developed under the administrative control of educational authorities.

In all of the larger cities a considerable body of school children attend parochial and private schools. The public school health service as a tax supported agency can, therefore, carry on health work among these children only through the coöperation of the authorities maintaining the schools outside of the public system. Health supervision of children in private and parochial schools for many years has lagged far behind that of the public schools. The

need for such work is, however, now so well recognized by all educational authorities that most of these separate schools either provide for the health examination of their children by public school authorities, or maintain their own health organizations in coöperation with those of the public schools. Where parochial and private schools are not adequately equipped for independent health work, it is the health officer's duty to seek their coöperation in order that the benefits of health supervision and training may be extended to all school children. The existence in the community of a large group of children without such supervision is a serious handicap to the development of effective community-wide coöperation for child health, and a source of great danger in spreading communicable diseases.

The Essentials of Good Health Supervision of School Children

Health supervision of school children has two chief phases. The first is the detection of children having infectious diseases and their exclusion from school until they can no longer transmit disease to others. The second is the detection and correction of physical defects which impair health and lower the efficiency of children in their school work. The school physicians, who are usually part time employees, visit the schools daily and first examine children suspected of having infectious disease as they are referred by school nurses or teachers. This duty having been performed and the children found to have communicable disease having been sent home, the health authority is notified of the facts and the usual official disease control procedures established. The school physicians then direct their attention to the examination of children to discover those having physical defects. Those found to have defects needing correction are noted, their parents notified of the physicians' findings, and the school nurses instructed to follow up each case to see that the treatment advised is provided by the parents, either at their own expense or by public and private agencies for medical care. The nurse is expected to explain the situation fully to the parents and to enlist their coöperation for child health in every possible way.

The procedure above described is that commonly carried out in our cities, whether the school health work is administered by health or educational authorities. Undoubtedly, it has done much to better the health of school children but there are certain very obvious defects in the procedure which are recognized by health authori-

ties. The correction of physical defects of school children depends primarily upon securing the coöperation of parents, for although the law may permit the examination of children by school physicians, it does not require that parents shall do what physicians advise, nor does it give physicians or nurses the right to treat children for their physical defects without parental consent. The school nurse is able to secure the coöperation of parents in many instances, if she is tactful and helpful, but as a rule parents prefer to get their advice on the treatment of their children from physicians rather than nurses. It is impossible for school physicians to consult with parents in all cases where treatment of children is necessary, although they endeavor to do so in many cities. The physician, if on part time, finds his time taken up with the necessary routine work of examining children. If he does this well he has little time for anything else. Then, too, as a private practitioner, he must be extremely careful in his school work to avoid criticism by his fellow practitioners. Attempts on the part of the school physician to establish personal contact with the home almost invariably brings criticism from other physicians who consider that this is an official encroachment upon the private practice of medicine.

Another serious difficulty in the way of securing adequate correction of physical defects is that part time school physicians are not ordinarily able to make satisfactory examinations in the school. Since their time is limited by the exigencies of their private practices, examinations must necessarily be hurried, particularly if physicians are expected to give each child a physical examination once a year. Besides, their examinations are necessarily superficial because of the quite natural objection of parents to the complete exposure of their children's bodies, even when this is done with the utmost circumspection. It is impossible to give a fully dressed child a good physical examination because the clothes prevent the physician from applying the necessary tests of body structure and function, and the school physician cannot go as far as he would like to go in establishing diagnosis when his effort may inconvenience or distress the child. So he is practically limited in diagnosis to what he can see, hear, and touch with the least possible delay and the least possible exposure of the child's body.

The results of school examinations in the correction of physical defects are, therefore, dependent not alone upon the coöperation of parents at all stages of the examining procedure, but upon the

adequacy of the examination procedure. If parents could be present in all cases, complete examinations could be conducted under their own eyes and with their approval, and it would be much easier to convince them of the necessity of prompt action for the correction of defects discovered. They would have the benefit, under such circumstances, of the physician's advice and they would be more likely to respect it if received at first hand from him than when his advice is passed on to them by the customary form report or by the nurse.

Since it is rarely possible under existing procedure of medical school inspection to provide for direct contact of the school physician and the family, the writer has attempted in several cities to outline a system of procedure for the detection and correction of physical defects which would bring into close and harmonious coöperative relationship all parties concerned—physician, nurse, teacher, child, and parents. The essentials of this plan are: (1) the employment of school physicians on full time who will have no outside interest in private practice; (2) the preliminary classification of all school children on the basis of their apparent health need, by teachers and school nurses; (3) the reference of children, according to their apparent health needs, to the school physician and his complete examination of them in the presence of parents at his private office. The method of work under this plan is described in the following excerpt from a health survey of the city of Montreal, Canada.

It is noted in the summary of work performed by the school medical examiners of the Montreal bureau of hygiene that out of 77,210 pupils examined in 1916, 37,730 or 49 per cent were found without physical defects and 39,480 or 51 per cent with physical defects. It will be found by examining reports of previous years that these are about the usual proportions of pupils with and without physical defects. It is clear, therefore, that about one-half the time of physicians is spent in examining children who are normal so far as the examination discloses. In other words, about 50 per cent of the time of physicians is lost in examining normal children. The first problem then is how to make a preliminary selection of pupils which will bring to the attention of the physicians only those children who require examination, and thus reduce the work of physicians 50 per cent.

To accomplish this preliminary classification of children, as those requiring attention and those not requiring attention, or at least not immediate attention, it is recommended that nurses and teachers be

instructed by the use of properly devised handbooks or manuals in methods of detecting the signs of physical defects. Special card records should be devised on which the teacher or nurse may note conditions indicating possible physical defects, such as complaints of headache, squinting, running or sore eyes, ears or nose, sore throat, mouth breathing, faulty posture or limping gait, etc. With proper training any observant teacher or nurse can detect the signs which indicate that something is wrong. When all cards for each school class are filled out these cards should be turned over to the physician medical inspector who should then classify the children on the basis of the card records as those requiring attention and those not requiring attention. He should then instruct the nurse to advise the parents to bring the children to his office for careful examination.

The medical inspectors under this plan should be on full-time duty and by full time is meant that they should not be allowed to engage in any private practice whatever. Each physician should receive not less than $2,100 a year as an initial salary and should be required to live and have his office within the district which he supervises. Physicians of the present staff unwilling to accept assignments on this basis should be replaced by other young physicians. In view of the reduction of the number of examinations required under this plan, it is believed that the present number of inspectors (16) available for active service can be reduced to nine. Nine of the present active force with the present physician office assistant of the divisions of contagious diseases and medical school inspection, who should be transferred to field duty, would give ten full-time physicians. Ten physicians on full time at $2,100 a year each, and living within their districts, could accomplish all and more than is now being accomplished by fifteen inspectors at $1,800 a year on supposed full-time but actual part time and not resident within their districts. Furthermore, such a plan would mean an actual saving in salary cost of $4,800 a year even with the increases of salary suggested.

The advantage of this plan is not only that it permits more effective examinations to be made, but also that it guarantees a greater percentage of treatments for physical defects. The child may be brought to the doctor's office in the school by its parents or by the nurse, and may be given as careful examination as a physician would make of a private patient in his own office. There would be no need for hurry in the procedure and the doctor would have at hand all facilities for proper examination. Furthermore, parents would have greater confidence in an examination conducted under such circumstances, and the necessary advice coming from the physician at the time of examination would carry much greater weight.

Under no circumstances should the physician offer treatment. His function should be to examine and advise only, recommending when

necessary the proper free dispensary or referring the child to the family physician.

The saving of salaries affected by the change of procedure outlined above together with other savings through general reorganization of the department would permit the employment of eleven additional nurses at $900 a year. These additional nurses plus the nine already employed would give a force of twenty nurses. At least two nurses should be assigned to each physician and placed under his immediate supervision. It should be their duty also to follow up in the home such cases as might require further education and instruction, in addition to assisting the teachers in making the preliminary separation of children as with or without defects in the manner described.

The above plan is a radical one, it is admitted, but it is believed that it will guarantee better results than the present plan. It would be well perhaps first to put the plan recommended into operation in a single district as an experiment. A district should be selected in which the coöperation of teachers may be expected, and a physician of proven ability selected as the district school physician. A manual of instruction for teachers and nurses, and the necessary cards should be prepared and teachers and nurses instructed in their use. After six months' or a year's trial of this plan, its results can be compared with results outside the experimental district and conclusions drawn which will determine what further action should be taken either for or against the extension of the plan to the entire school system.

In the summer months these school physicians and nurses should be regularly assigned to infant milk station work, the investigation of infants' homes or boarding houses, tuberculosis dispensary service, etc. The school physician resident in the district should make it his business to study local health conditions there and to act as the health advisor of the people within his district, and he should be required to perform all vaccinations necessary. He should also be responsible for the sanitary inspection of school buildings within his district. In short his office at the school should be the center for health information and instruction for his district community.[5]

Where good results in the correction of physical defects are being obtained under the usual plan of employing part time medical inspectors, it would perhaps be unwise to make any radical change in policy such as has been described. On the other hand, it is certainly true that much of the time of physicians is being wasted

[5] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Montreal, Canada,* 1918 (typewritten), pp. 1284-1287.

in attempts to give every child a superficial examination every year. To make an efficient examination of every child every year would require an increase in the number of physicians which would be prohibitive in cost for many cities. Studies made by Dr. S. Josephine Baker, former director of the bureau of child hygiene of the New York City department of health, and others, have shown conclusively, first, that out of every 100 children examined more than half do not require complete physical examination, and second, that it is sufficient for school health supervisory purposes if complete physical examination is not given children after the eight to ten year period, except for such children as apply for work permits prior to the completion of the compulsory school period. Dr. Baker says:

> We may assume that a thorough physical examination means exactly what is implied by the words. It does not mean a superficial *inspection* of the child; it implies a careful determination of its physical condition, and consequently takes time and inevitably costs money. To carry out annual *inspections* and term them *examinations* is worse than useless; in fact, it may be harmful. *Health* inspections of children, carried out in a routine manner, are of distinct value, but such inspections should be made a part of the regular health supervision system, and once a month is none too often to have them made. Physical examinations are an entirely different matter. In order that these may be of any value, they should be at least as thorough as we would naturally expect a physician to make in his own office.[6]

In view of the information available regarding the need for physical examinations among children, as brought out by Dr. Baker and others, the following procedures are suggested as embodying the elements of any plan for the detection and correction of physical defects of school children.

1. Thorough physical examination of every child at the beginning of its school career.
2. At least one other thorough physical examination of every school child after admission and just before the eight to ten year age period.
3. A thorough physical examination of every child applying for working papers.

[6] S. Josephine Baker, *Child Hygiene*, 1925, p. 365.

4. An annual test of vision of all school children. (These tests can be given satisfactorily by nurses and teachers if they are properly trained for the work.

5. Routine classroom *inspection* of children at least once a month by teacher or trained nurse.

The adoption of such procedure would undoubtedly reduce materially the amount of work required of school physicians and tend to improve the quality of the service rendered by them. Unless provision is otherwise made for the physical examination of children applying for working papers, it would, of course, be necessary for school physicians to make such examinations of children after the eight to ten year period as would prevent the entrance into employment of physically defective children. This is on the assumption that the child labor law of the particular state prohibits, as it should, the issuance of working papers to children who are physically or mentally incompetent. We shall speak of this matter in a later section.

The Mental Defects of School Children

In most of the larger cities, departments of education make provision for testing the mental age of children and for the adjustment of the school curriculum to the mental ability of those found subnormal mentally but capable of educational progress. Special classes for backward and mentally subnormal children are provided and many such children show substantial mental improvement under skilled educational guidance. The correction of the physical defects alone is sufficient in many instances to restore a backward and apparently mentally subnormal child to normal. The average school physician is, however, not competent to make a satisfactory determination of the mental status of the child nor to advise what should be done for those who are mentally deficient. For such determination and advice a skilled physician-psychiatrist must be called upon.

From the point of view of the educational authorities whose interest is primarily in the instruction of children, it is highly important that educational work for normal children shall not be hampered by large numbers of children who are incapable of keeping the school pace. The advice of the psychiatrist on this point is essential, for no matter what the child's capacity for education may appear to be, there are many other factors to be con-

sidered in determining the propriety of his continuance in the public schools. Certain types of mentally defective children may get on quite well in their studies but their association with other school children may be neither in the interest of the latter nor of the public.

If there is in the health department or department of education a special mental hygiene clinic with a competent psychiatrist in charge, all children whose mental status is apparently such as to make their continuance in the schools inadvisable, either because they evidence incapacity for mental development or because they are otherwise unfitted for school associations, should be referred to the mental hygiene clinic for further examination and appropriate action. If the public school is not the proper place for them, effort should be made to provide for their custody, care, and training in institutions for such purpose. It would be an extremely unwise thing to exclude mentally defective children from the public schools without making any provision for their care elsewhere under proper guidance and control. Few such children can be adequately cared for in their homes because marked mental defects which may be apparent to trained observers may be quite overlooked by parents or made light of to the child's disadvantage, often to the great distress of both parents and public.

As we have earlier suggested, many of the mental defects of children can be corrected by proper treatment. Failure to provide adequate treatment facilities for such children and for their custodial care under treatment, means that the community will be called upon to carry a steadily increasing burden for the maintenance of hospitals, prisons, almshouses, and other institutions for adult dependents and delinquents.

The promotion of mental health is decidedly a function of a municipal health department although as yet relatively few cities have undertaken work of this character. It may be well enough to leave it to the departments of education to determine how far they should go in their efforts to deal with those mentally subnormal children in the schools, who are capable of school care and training. But educational authorities are hardly competent to deal with all phases of supervision of mentally defective children. The health department is the logical agency to deal with the problems of mental hygiene in its broader aspects, not alone because of its primary responsibility for sickness prevention, but because of the

close and intimate relation which exists between the promotion of the mental health of children and all other phases of child hygiene work. If the health department has developed, as it should, its contact with parents and child from the very beginning of child life, it is in a better position than any other official agency to deal intelligently with the special needs of parents and children for mental health advice and direction.

The first division of mental hygiene of a municipal health department was established by the city of Chicago in 1919. This division examines, advises, and undertakes the supervision of all mental defective adults and children referred to it, coöperating with physicians, family, and other agencies as may be necessary. To illustrate the special service offered by such a division, the following child history is cited by the health commissioner of Chicago in one of the weekly bulletins of the health department:

A boy of twelve years was referred to the health department as refractory, obscene, and a constant annoyer of little girls. His school record showed him to be an advanced subnormal. The family history revealed that the father died an alcoholic, and the mother mentally inferior. Examination proved the boy mentally retarded to the point of imbecility. He was sent to a home for the care of this type. In this case the child study department of the schools agreed upon the diagnosis but were helpless as to the remedial measures. The health department took the necessary action.

The case cited by the health commissioner of Chicago is not an extraordinary one; such children can be found by careful inquiry in almost every large group of school children, and there is no official agency as competent to deal with them as the health department. To continue these children in school is not only a serious economic loss in the use of public funds for education, but a decided health hazard to other children. Facilities for dealing with these "problem" cases are notoriously inadequate in all cities, even where effort is made to do so as in Chicago. More information is needed about them so that legislation for their supervision and care can be wisely planned, and a first step in the program is the establishment of a mental health clinic, preferably in the health department, which will work in the closest coöperation with the child hygiene bureau and all other health and welfare agencies, public and private. If the mentally defective children can be found and placed under proper supervision and care, a long step will

have been taken toward the solution of the problem of preventing mental disease and defect among adults.

Health Supervision of the Employment of Children

In general the child labor laws of the majority of the states set up certain standards of age, education, and physical ability which the child must meet before he can be employed in certain occupations. The laws are enforced by requiring the child to secure a work permit or "working papers" either through the school authorities or health authorities, and by inspection of places of employment by a state department, usually a state labor department. The responsibility of local health or educational authorities is limited in the main, under this system, to issuing the work permits.

There is little uniformity in state laws with respect to age, school attendance, health, nature of employment or other conditions to be considered in determining the right of the child to enter employment before the termination of the compulsory school period. In many states child labor laws do not apply to the employment of children in farm work or domestic service, and regulation of the employment of children depends mainly upon the operation of the compulsory school attendance laws which are in force in all states. In a few states the child labor laws are supposed to cover all "gainful occupations," but as a matter of fact there is little or no regulation even in these states of employment of children in farm work or house work except as enforcement of the compulsory education law may provide.

The minimum age at which children may work is fourteen years in most states and in a few states fifteen years or over. There are, however, certain exemptions ordinarily allowed in all states, and the application of this minimum age requirement has other specific limitations. It is generally recognized that children under fourteen years of age should be at school and not gainfully employed, and the exemptions allowed are contingent mainly upon the character and hours of work and the physical development of the child.

The educational requirements of child labor laws show less uniformity than those of reference to age. In eighteen states there are no fixed educational standards of significance. In only thirteen states is it required that the child shall have completed at least the eighth grade before being granted a work permit and there

are certain exemptions allowed in the enforcement of this rule. The other state laws show all sorts of variations between these extremes.

The far more important question of the child's physical fitness for employment is covered in some way by all except nineteen states, and twenty-two states require an examination of the child by a physician prior to the issuance of the work permit. Seven states and the District of Columbia give the officer issuing the work permit power to require an examination if he thinks necessary. Better state laws are clearly needed.

We cannot give place here to full discussion of the many-sided problem of child labor in its relation to health. It is certain that there is need not only for better enforcement of existing laws but also the enactment of more uniform laws of higher standard in many states, particularly with respect to the health examination of children applying for working papers.[7] If the character of the intended employment indicates a possible hazard no child should be permitted to go to work in any case until he has had a complete physical examination by a medical officer of a department of education or department of health. If the work of school medical inspection is under the direction of the department of education, that department should be responsible for the child's examination and certification as fit for employment. If school health work is carried on by a department of health, the health officer or his medical representative should perform this function. The examination should preferably be an official examination, that is to say, the certificate of a private physician should not be accepted. Even where the state law does not define the responsibility of local authorities in the matter, much may be done to prevent the employment of physically incompetent children by health and educational authorities through direct appeal to the parents of physically handicapped children and through coöperation with employers.

In the states where physical examination is mandatory and work permits can be refused if there is evidence of the child's physical disability, strict enforcement of the law serves to secure the correction of physical defects which may previously have been neglected by parents. The child with defective vision, enlarged or diseased tonsils and adenoids, defective teeth, malnutrition, or other physical defects of a remediable nature should be refused the work

[7] United States Department of Labor, Children's Bureau, *Child Labor in the United States, Ten Questions Answered*, Children's Bureau Publication No. 114 (third edition), 1924.

permit until the defects have been corrected. This final check up of physical defects of school children is a most necessary thing in child health betterment, for once the child has gone out into employment, local official contact with him is not readily made and his health protection must in most instances be left to state authorities who have not such direct interest in him as an individual.

Given compulsory school attendance, a satisfactory system of physical examination of school children, and a child labor law fixing proper age limits for employment of children in various occupations, and permitting local health or educational authorities to refuse working permits to all children who do not measure up to satisfactory physical standards, few physically unfit children would be likely to enter employment. The need of better school health work in the correction of physical defects and for child labor laws which will make it possible to insist upon the correction of remediable defects before work permits are granted, is amply illustrated in the reports of the war department on the first examination of the men between the ages of twenty-one and thirty under the selective draft of 1917. About a third of them were found physically unfit to fight and of this third, about 15 per cent were seriously handicapped for civil life. Not all of these handicaps were remediable perhaps, and some of them no doubt did not make their appearance until long after men had left school, but certainly many of them might have been avoided or remedied by good health protection during school life. The provost marshal general's figures indicate that about 22 per cent of the rejections were because of a mechanical defect of the body or a disease or defect which interfered with mechanical function, such as defects in bones and joints, flat foot, hernia, etc. About 15 per cent had imperfections of the sense organs, and about 13 per cent defects in the cardiovascular system. Twelve per cent had mental and nervous troubles; 8½ per cent, developmental defects in physique; about 6 per cent, defects or diseases of skin and teeth; 10 per cent, venereal diseases and tuberculosis; and 13½ per cent, other miscellaneous diseases and defects. It would appear from this analysis that many of these defects must have existed during the school years and would probably have been detected and corrected under an efficient system of school health supervision.

Coördination of Child Health Agencies in a Common Program

To obtain best results in child health work, all of the various

activities which have been outlined in the preceding pages of this chapter should be dealt with as a single entity, even if not under the control of a single authority. Each of these activities has a close and intimate relationship with all others, and high efficiency cannot be obtained in any part of the program unless such relationship is fully recognized. In consequence the development of efficient child health work by municipal health departments is sometimes badly handicapped by a division of responsibility and consequent lack of coöperation between the health department and other agencies, public and private. In a majority of the larger cities infant hygiene work is carried on either independently by private agencies or jointly by the health department and private agencies, and school health work is more often under the direction of departments of education than departments of health.

The character of the organization of the health department necessary for child health work will, of course, be largely determined by what other agencies are doing in the field, how well they are doing it, and the coöperative relations existing between all agencies, public and private. If infant hygiene work is being done satisfactorly by private agencies coöperating fully with the public health authorities and recognizing the right of the latter to a seat in council on all matters affecting public health, there is no special reason for the health department "taking over" the activities of private agencies. The same is true with respect to school health work which is being done efficiently by educational authorities and in close coöperation with the health department. But it is certainly true that too great division of responsibility for child health work is a handicap to the health department and prevents it from taking its proper position of leadership in the community health program. Child health work, as we have already noted, offers the greatest possible opportunity for public health education and public coöperation, and if primary responsibility for its most important activities is not vested in the health department, citizen interest in health matters is likely to become focused on the work of agencies other than the health department. If this occurs the health officer may find it difficult to secure sufficient funds for the support of the public health service, not only for child health work but for other work of the highest importance.

The private health agencies, which in many cities have been the pioneers in infant health work, are naturally reluctant to give up

control of the many special activities which they have developed and, perhaps, put themselves out of existence by transferring control of their work to public officials. The trend is, however, in this direction, and properly so, for until the community as a whole has been brought to the point of recognizing its responsibility for supporting by taxation the necessary activities for community health, and particularly those for child health, it is not likely to have as much concern about government as good government needs. An illustration of the truth of this statement is to be found in Cincinnati, where the activities of private agencies in the field of child hygiene have been tremendously expanded in order to meet needs which should have been met by the official health department. As a result of the growth of the private child health agencies, the citizens of this city have come to look for leadership in child health work to the private agencies rather than to the tax supported health department. As a further consequence, the health department has not been able to utilize the appeal of child health work in securing funds for its own operations, and it has been forced to carry on for years with a health budget far below that actually needed for efficient work in all fields of public health work.

The problem of developing a well coördinated plan of child health service in a city where direction and control of child health activities is widely distributed is illustrated in the following description of the organization and functions of public health nursing agencies in Grand Rapids, Michigan:

> The public health nursing agencies of the city of Grand Rapids considered in the course of this survey comprise the following:
>
> 1. *The School Health Nursing Service* comprises a trained nurse supervisor and thirteen trained nurses under the direction of the health officer. Their duties include:
>   a. Furnishing information to the principle of the schools as to the children under the health supervision of nurses.
>   b. Assisting school physicians at examination of pupils and in carrying out physicians' instructions as to health betterment of children.
>   c. Escorting pupils to dental clinics (pupils of grades 1, 2 and 3 only), and making clinic appointments for older children during vacations and after school hours.
>   d. Instructing children individually and in class groups regarding hygiene, and inspecting classroom groups monthly.

e. Detecting communicable diseases, and in the absence of school physicians, excluding suspected cases from school. In such cases report is made to the health department.

f. Making home visits for the correction of physical defects of children and to see that any pupil who is ill receives proper medical attention. (Pupils excluded for smallpox, scarlet fever, measles, whooping cough or mumps may not be visited by school nurses.)

g. Advising parents regarding correction of physical defects of children and other health matters including diet, personal hygiene, treatment of conditions such as pediculosis, scabies, etc., and the application of minor dressings.

h. Making monthly reports on their activities to the supervising nurse.

2. *The Clinic for Infant Feeding,* a private agency, provides a public health nursing service which is conducted in coöperation with the health department. The service comprises a trained nurse superintendent, two trained nurse supervisors, and twelve trained nurses, nine of whom are assigned to districts for general child hygiene work and three to other special districts for prenatal work only. In 1922, four of the trained nurses employed as above were paid by the city. The budget of the health department for the fiscal year 1923-24 provides for the payment of five nurses. The general program of child care includes:

a. The visitation of expectant mothers by prenatal nurses and their advice and instructions regarding hospital or home care. Visits are continued, if the mother remains at home, through the period of confinement and afterward through the postpartum period in all cases where a mother was registered for prenatal visiting.

b. The follow-up of reported births in order to secure registration of infants and advise and help mothers in home or clinic.

c. Supervision of children of preschool age registered at clinics or otherwise. This supervision is continued until the child goes to school when the record of the child is turned over to the health officer.

d. Reference of all cases of ophthalmia of infants to the director of the Association for the Blind and to the health officer for registration. (The Association for the Blind employs a trained nurse to follow up such cases and see that proper treatment is given.

e. Attendance at clinic stations as may be required. The clinic service at the five stations includes general clinics for infants under two years of age, clinics for expectant mothers,

preschool age clinics, (ages two to school age), and nutrition clinics.

Of the five clinic stations, two are supported by the city. The remaining three are supported mainly by the Clinic for Infant Feeding, except that at one station (Central), a Saturday clinic for preschool age children and those requiring nutritional advice and aid, is supported jointly by the city and the Clinic for Infant Feeding.

f. In addition to the routine nursing work above described, the nurses assist in the collection and distribution of breast milk to mothers needing it whether in their homes or in hospitals.

g. According to the superintendent of nurses of the Clinic for Infant Feeding, the nurses of this agency also take care of children under school age who may be suffering from certain contagious diseases, chiefly measles, provided such children are registered with the Clinic for Infant Feeding.

h. In addition to the trained nurse service provided, the Clinic for Infant Feeding employs three lay nutrition workers to assist at clinics and otherwise in instructing and helping mothers and infants to secure proper diet.

3. *The Anti-Tuberculosis Society,* another private agency, comprises a chief nurse and five trained nurses of whom four are assigned to city districts for routine work and one as director of the modern health crusade program in the city and county. This latter nurse also has supervision of three open air schools conducted by the board of education and under the supervision, also, (with respect to medical examination of children) of the director of the tuberculosis service of the health department. The routine duties of the four nurses assigned to district work include:

a. Investigation of all cases of tuberculosis reported to the city health department or otherwise discovered.

b. References of tuberculosis patients to hospital, clinic or otherwise as may be required.

c. Instruction of home patients and members of their families in prevention and home hygiene and sanitation. This includes the distribution of special literature furnished by the Metropolitan Life Insurance Company and the national organizations for tuberculosis prevention.

d. Bedside nursing of tuberculosis patients as may be necessary. (This work is gradually being reduced owing to the improved facilities now available at the tuberculosis sanatorium.) This service is strictly a nonpaid service.

e. Attendance at tuberculosis clinics as may be required. Four

clinics are held weekly under the supervision of the director of the tuberculosis service of the health department.

In addition to the general and special nursing service as above outlined, the society maintains the Sunnybanks Preventorium with twenty-three beds for undernourished children.

4. *The Visiting Nurse Association,* also a private agency, comprises a superintendent of nurses, an assistant (also a trained nurse), and nine nurses, eight of whom are assigned to special districts, and one to "floater" duty, *i.e.,* relieving other nurses on vacations, sick leave, etc., making special investigations and performing such other out-of-routine duties as may be necessary. The superintendent states that a regular staff of twelve field nurses is needed but that since the war the staff has not been recruited to its full strength. The routine work of the nurses of the Visiting Nurse Association includes the following activities:
   a. General bedside nursing work of all types. This work is done on a pay basis although patients unable to pay are not denied service if they need it. The scale of fees is from nothing to $1.50 per visit depending upon the nature of the case and upon the ability of the patient to pay.
   b. Bedside nursing and general health nursing service for all policy holders in the Metropolitan Life Insurance Company, including ten industrial and commercial organizations having group insurance in that company. In addition, one firm having group insurance in the Traveler's Insurance Company and one in the Aetna Life Insurance Company are served. Fees for this service range from 75 cents to $1.00 depending on the nature of the case.
   c. Four industrial plants and the Red Cross Civilian Relief are also furnished with bedside and general health nursing service on a contract basis.
   d. A special home maternity service is provided at a fee of $10.00 per case. This service includes registration of the patient, prenatal visiting and preparation of the mother for confinement, furnishing the supplies necessary for confinement, attendance at delivery when delivery is by a physician (not midwife) and the care of the patient and child in the partum period.
5. *The Association for the Blind,* a private agency, provides one trained nurse who is assigned to the special investigation and follow-up of cases of ophthalmia or infectious conjunctivitis of infants, trachoma and other infectious diseases of the eyes

and to coöperate with all other nursing services, public and private, for the treatment of eye diseases or defects of whatever nature.

6. *The City Physician,* a municipal employee, has under his direction one trained nurse for the investigation of cases of venereal disease as reported and general home visitation and follow-up when necessary of children and others applying to the city physician for medical relief.

For all of the services above outlined, the following corps of nurses (trained nurses only) is available:

	Supervisors or Superintendents	*Asst. Supervisors or Asst. Superintendents*	*Field Nurses*
1. School Nurses*	1	—	13
2. Clinic for Infant Feeding**	1	2	12
3. Anti-Tuberculosis Society..	1	—	5
4. Visiting Nurse Association.	1	1	9
5. Association for the Blind..	—	—	1
6. City Physician's Staff.....	—	—	1
Total	4	3	41

*Wholly under the direction and supervision of health officer.
**Under joint supervision of health officer and superintendent.

For a corps of 41 field nurses there are 8 supervisors or assistant supervisors, or one supervisor to every five nurses.

Each organization maintains its own headquarters and there is practically no routine exchange of information. In so far as districts are concerned, those agencies working on the district plan, namely, the Clinic for Infant Feeding, the Anti-Tuberculosis Society and the Visiting Nurse Association, have established districts according to the needs and the number of their nurses available. The school nurses must necessarily be districted according to the location of schools and the school population served by them. The districts of the three nursing groups bear no relation to each other either as to territory covered, numbers of population, or character and composition of population. It is, therefore, impossible to avoid duplication of visitation to homes. With respect to the nature of the cases under supervision, there is also inevitably duplication, since both the Clinic for Infant Feeding and the Visiting Nurse Association are engaged in prenatal home visiting. This latter type of duplication is a recent development owing to the establishment by the Visiting Nurse Association of a home maternity service. The superintendent of the Visiting Nurse Association holds, and with reason, that to be of the

best service to the mother at confinement and afterward, the nurse must visit and advise her prior to labor. Nevertheless, as this service is further developed, duplication of prenatal home visiting will be increased rather than diminished unless there is close coöperation between the two agencies.[8]

The question whether responsibility for public health nursing work should be lodged in public or in private agencies, is a basic one. Since child hygiene is peculiarly the field of the health nurse, the question really resolves itself into a determination of whether public or private agencies should be primarily responsible for the direction and control of child health work. With respect to the relative merits of public or private control of public health nursing the Committee for the Study of Nursing Education says:

The advantages of state or municipal control of public health nursing are patent. No private organization has the continuing financial resources of a public agency. School nursing, for instance, could never have reached its present country-wide extent under private auspices. Infant welfare work, too, under municipal agencies is reaching numbers of babies and mothers hitherto necessarily untouched by private organizations.

Besides the greater possibility of obtaining large funds, other advantages are inherent in state or municipal control of public health nursing. There is a definite gain, for instance, from having the bureau or division of public health nursing an organic part of the board of health, correlated with other divisions having jurisdiction over sanitation, housing, the control of disease, etc. There is also gain in having the legal power to enforce certain hygienic regulations such as registering and supervising the tuberculous, quarantining persons suffering from communicable diseases, etc.

But more important than any of these advantages is the growing sense of community ownership evident in various localities where nursing services are under public control. In the country, for instance, particularly in the west, people feel a genuine satisfaction in having the public health nurse, like the school teacher, a part of the tax paid town or county government, and rightfully available on equal terms for all. The future of public health nursing, as an agency of preventive as well as curative science, may well be envisaged as developing on a par with public education.[9]

[8] New York Bureau of Municipal Research, *Report on Grand Rapids Health and Hospital Survey*, 1923 (typewritten), pp. 89-95.

[9] Committee for the Study of Nursing Education, *Nursing and Nursing Education in the United States*, 1923, p. 79.

If it is inexpedient or impossible for the health department to take upon itself the direction and control of all child health activities, then it is desirable to bring about such coöperative relations with private agencies as will permit the coördination of all activities, public and private, in a common program and give the health officer general direction and oversight of the conduct of coöperative work. Centralized organization and direction of community forces for health permits the reduction in overhead costs and the elimination of duplication and overlapping of service.

Such a plan has been in effect in Dayton, Ohio, for several years. Prior to the establishment of the plan of coöperative work under the health officer's direction there were three public health nursing agencies, each maintaining its own organization, offices, and equipment. Now there is but one with headquarters in the health department. The former commissioner of public welfare of Dayton who was chiefly responsible for the development of what is commonly called the "Dayton Plan" says:

> Early in 1914 a coöperative public health nursing plan was inaugurated in Dayton, under which plan one city and two private organizations united into a single staff, at one headquarters (the offices of the department of public welfare), under a single control and direction. This was done for five reasons. First, economy of money; second, economy of time; third, efficiency in service; fourth, convenience to the public; fifth, a broader and more specific education in the home.
>
> The city is divided into thirteen districts, each district served by one nurse, thus covering systematically and effectively, and without overlapping, the entire city. One of the outstanding results of this plan has been the gradual reduction of the baby death rate in Dayton from 139 per thousand (births) in 1913 to 84 in 1918.[10]

The Organization of Child Hygiene and Public Health Nursing Work

The organization of child health work in a municipal department will be determined largely by the community's attitude with respect to the control of public health nursing since the latter is the very essence of efficient child health service. If the community is able and willing to carry on the necessary child health activities as a tax

[10] *The Department of Public Welfare, City of Dayton*, 1919 (Municipal Report).

supported service, the logical procedure is to establish within the health department, a bureau or division of child hygiene and public health nursing, with a competent director or chief at the head of the unit. The chief question then to be solved is how the nursing force shall be assigned to field duty. As we have noted, trained nurses are essential in good communicable disease control, in prenatal care of mothers, the inspection and supervision of midwives, health supervision of children of preschool age, inspection of infants' boarding homes and day nurseries, and in school health supervision. The natural tendency in the organization of health nursing activities is toward specialization of nursing assignments in these various fields. The nurse specialist in communicable disease work, prenatal work, school health work, etc., does acquire a technical skill on dealing with these special activities which she could not acquire if her duties were of a more general character. The difficulty is that specialization in public health nursing tends to considerable overlapping and duplication of work and prevents the nurse from acquiring a well rounded view of the many sided problem of community health. So there is a growing feeling on the part of health authorities that the nurse should be a public health nurse rather than a communicable disease nurse, a tuberculosis nurse, a prenatal nurse, a school nurse, or what not. The necessity of conserving public funds compels the elimination of all possible duplication and overlapping of nursing activities. Furthermore, as knowledge of public health needs has grown, it has become apparent that to deal effectively with the individual "case" of sickness, the health advisor, *i.e.*, the nurse, must be capable of dealing also with a great variety of related problems in the home.

"Generalized" public health nursing, in contradistinction to "specialized" nursing, means simply that nurses are assigned to general nursing work of all kinds in small districts instead of being assigned as individuals or groups to special types of nursing activity on a city wide basis. Generalized nursing in its broadest sense includes not only "instructive" nursing but bedside nursing as well. In municipal health work, the actual nursing care of the patient, *i.e.*, bedside nursing, is not commonly regarded as a public health function, and is left in the hands of private agencies. It is, however, very difficult to separate instructive nursing from bedside nursing because, in many instances, the success of the health nurse's effort to instruct and advise is contingent upon her helpfulness in actual care of the sick patient. When a member of the

family is sick, the nurse who is prepared to do something tangible for the comfort and relief of the patient is better able to get a hearing for her advice on other health matters. It often happens that her success in preventing disease depends upon her management of the individual case of illness. On the whole, it is believed that generalized nursing work on the district plan as carried on by municipal health organizations ought to provide within reasonable limits for bedside care of the sick who are in need of nursing care and cannot otherwise obtain it.

Whether the health nursing services of the health department are organized in a bureau or division of child hygiene or as an independent bureau or division of public health nursing, makes little difference. Inasmuch as the bulk of the work of public health nurses falls within the field of child hygiene, it is the writer's judgment that the establishment of an independent bureau or division of public health nursing is rarely necessary. Properly organized according to the generalized nursing plan, such work as might be required of nurses for other bureaus of the health department, could be carried out satisfactorily by and under the direction of the head of the child hygiene bureau with perhaps a nurse superintendent in direct charge of the nursing personnel and their assignments.

In adapting the generalized nursing plan to school health work, some difficulties arise owing to the need of arranging districts so that the school work and other child health work may be fairly distributed among the nurses. The location of the schools may bear no relation to the field of nursing work along other lines. In some cities where such adjustment of district lines for school work and other assignments cannot be satisfactorily made, it may be necessary to leave school nursing out of the district plan and assign a special nurse squad to this service alone. As a rule, however, it will be possible, if the general districts can be made small enough, to distribute the school work fairly among the various district nurses. This is the more desirable plan because of the close relationship which exists between the school and the home.

It is considered that under the generalized nursing plan, the nurse's district should not include more than 2,000 population. In a city of 50,000 population there would be needed, then, at least twenty-five trained district nurses. There are very few cities indeed where anything like this standard is maintained, and few health departments are able to secure sufficient funds to carry on

any such program. The need may perhaps be met by the adoption of a coöperative plan such as that of Dayton, in which the burden of maintaining the necessary personnel is divided between the public health department and private agencies. Where school health work is under the direction and control of educational authorities, it is, of course, not as easy to carry out the complete program of generalized nursing. School health authorities are reluctant to permit their nurses to be utilized in other health activities. This is, however, a short sighted view of the problem, for after all the efficiency of school health work depends largely upon what has been done for the health of the child before school entrance.

Assuming, then, that we are dealing with a city in which the volume of work in child hygiene necessitates the setting up of a special health department bureau, or division for the purpose, and assuming further that all child health activities are under health department control, or at least under the health officer's direction, the bureau of child hygiene and public health nursing would require the following as a minimum:

1. A director, preferably on full time, with training and experience in child health education and in the various medical and nursing activities called for in the child health program.

2. A competent corps of office assistants to attend to routine clerical and stenographic work.

3. A staff of physicians, preferably assigned to districts to carry on school medical work and such other related inspectional and investigational work as may be necessary in communicable disease control. The number of physicians required would depend mainly upon whether they were on full time or part time, the area of the city, its school population and the distribution of its schools. It is considered that there should be one part-time physician for each 2,500 to 3,000 school children. This would mean for a city of 50,000 population with its 8,000 to 10,000 school children, at least three part-time physicians. If other duties than school duties were required, the number of part-time physicians would perhaps have to be augmented. If full time service were required, fewer physicians would be needed.

4. A staff of trained nurses assigned to districts on the basis of one nurse to each 2,000 population. In a city of 50,000 population, and assuming twenty-five district nurses, it would be desirable to have at the head of this force a superintendent of nurses with

possibly two supervisors of field work. Provision should also be made for two or three nurses for "floater" duty, so called, to assist district nurses in emergency, and act as relief nurses during vacations and sickness absences of other nurses.

While the ratio of physicians and field nurses to population would be much the same in any city, the amount of overhead supervision required would be dependent on the numbers of field workers and the arrangement of districts. In a small city it might be quite unnecessary to provide for a director of child hygiene or a superintendent of nurses. The health officer himself might well be able to give his personal attention to direction of the work of field nurses.

Districts should be arranged as far as possible so that they will represent groups of census enumeration districts. In taking the federal cenus the population is divided into small enumeration districts and the census figures for the city represent the composite figures of these small districts. In any organization of health work on the district basis, it is apparent that where the health districts coincide with groups of enumeration districts, it is much easier to make comparisons of the statistics of births, death, and sickness of such health districts. If the health districts are not so constituted, it is well nigh impossible to make proper comparison of such facts and to measure satisfactorily by comparison, the relative efficiency of the district physicians and nurses. Facsimiles of the census reports on the enumeration districts may be obtained from the Bureau of the Census at Washington; these are of great value in planning a district health service.

CHAPTER XI

FOOD INSPECTION

The term food inspection includes, in its broadest sense, all health activities for the prevention of food adulteration. Food may be adulterated in such a way as to cause harm to the consumer, either because it is contaminated by disease germs or poisonous substances, or because it defrauds him of food value. In this discussion we are concerned chiefly with the forms of adulteration of the first type, and the methods of preventing adulteration which are designed to protect the consumer against such direct health injury. Food inspection for the purpose of preventing economic loss to the consumer is a matter with which municipal health departments are not primarily concerned, as we shall see.

Although sanitary regulation of methods of production, handling, storage, and sale of foods has always been regarded as an essential feature of local health service, it was not until 1906, with the enactment of the federal pure food and drug act, that food adulteration was clearly defined and a sound basis laid for local regulations. The federal government is not concerned with the regulation of the food business within states; it deals only with foods in interstate commerce. The pure food and drug act did, however, establish certain definitions of adulteration and misbranding of foods and drugs which have in the main been accepted by the various states and municipalities for the regulation of food business within their areas of jurisdiction. Food adulteration, *per se,* does not constitute an offense against the federal law; the offense is committed when adulterated food enters interstate commerce. Regulations defining adulteration within states and the inspection necessary to enforce them are left to the states and their local authorities.

Without going into the various types of food adulteration in detail, it may be said that under the federal law which is the usual basis of state law, food comprises all articles of food proper, and all beverages and confectionery used by man. Food adulteration as so defined falls into several categories, chief of which are:

1. If any substance has been mixed or packed with the food so as to reduce, or lower, or injuriously affect its quality or strength.

2. If any substance has been substituted wholly or in part for the food article.

3. If any valuable constituent of the food has been wholly or in part abstracted.

4. If the food consists wholly or in part of diseased, decomposed, or putrid animal or vegetable substance, or of any portion of an animal unfit for food, or is the product of a diseased animal, or one that has died otherwise than by slaughter.

5. If the food is mixed, colored, coated, polished, powdered, strained, or otherwise treated so that damage is concealed, or made to appear better than it really is.

6. If the food contains any added poisonous or harmful ingredient, or any antiseptic or preservative not evident and not known to the consumer.

Adulteration of drugs which is also defined in the federal law, has many categories which cannot be discussed here. In general, state laws regulating the sale of drugs conform to the standards of the federal law, the chief provisions of which are that they shall be of the standards established by the United States Pharmacopoeia (U.S.P.), or National Formulary (N.F.), or if not of such standard, shall be so labeled as to strength, quality, and purity as to permit no deception. Misbranding, another of the matters with which the federal law deals, means putting on the label of the food or drug product offered for sale any statement calculated to deceive the purchaser.

Enforcement of state laws relative to the adulteration or misbranding of drugs is not as a rule provided by municipal health authorities except in a few of the largest cities where the maintenance of special laboratory facilities for drug analysis is possible and practicable. Such inspection of drugs as is necessary is usually performed by a state health department, or bureau of foods and drug regulation in the state department of agriculture.

The Responsibilities of State and Local Health Agencies for Food Regulation

As already noted, there are two distinct phases of food inspection with which state and municipal authorities are concerned. The first is the protection of health of the community; the second, the protection of the community from fraud. For example, milk is adulterated and dangerous to health when disease germs or filth

enter it as the result of improper production or handling. It is adulterated, but not necessarily dangerous to health, if it is watered, provided the water is clean and pure, or if it is sold as whole milk when the cream has been extracted. In the former instance a distinct health danger results; in the latter instances the consumer may suffer economic loss, but his health is not necessarily endangered. It is, of course, possible that the health of the individual may be impaired by the use of skimmed milk or watered milk, if milk happens to be the sole item of diet, as in the case of infants, but there is nothing inherently dangerous to health about either clean watered milk or skimmed milk. The same is true of other foods which may be technically adulterated yet contain no harmful ingredients.

Responsibility for food regulation is usually divided between state and local governments. In the main, local health authorities are permitted great latitude in the enactment and enforcement of food regulations for the direct protection of the health of their own communities. When it comes to the prevention of adulteration in its relation to the economic welfare of citizens, the state, as a rule, assumes primary responsibility since the problem is one which, because of its commercial bearing, cannot be dealt with satisfactorily by local agencies. The state may exercise such control through its state health department, or it may set up, as many states have done, a special department or bureau of food and drug control. On the whole, it is believed to be more satisfactory for the state to center all food regulative effort having a direct bearing on health in a state department of health, since this department is better able to maintain its aloofness from commercial influences which might tend to break down law enforcement, and because health authorities have particularly broad regulatory powers where the public health is menaced, or likely to be menaced.

In our subsequent discussion of food inspection, we shall limit ourselves to consideration of health administrative practice as it concerns the prevention of food adulterations which are directly harmful to community health. For purposes of our discussion, we may define municipal food inspection activities as falling within three major groups, namely, milk inspection, meat inspection, and inspection of other foods. We shall not consider here the question of drug control nor misbranding of food products, since these matters can be better handled by state and federal agencies, and are so handled except in a few of the largest cities.

The Requirements of Good Food Inspection

The first requirement is that the municipal health authority shall have a reasonable, and enforceable code of regulations for the sanitary control of food supplies. This code of local regulations should be based upon the general health laws of the state, but when these laws are inadequate, there is ample precedent to warrant the municipality in going beyond them, if local conditions warrant. For example, the health officer may find it necessary to exclude milk from the city which is not produced from cows whose freedom from tuberculosis has been guaranteed by negative tuberculin tests. The general laws of this state may not prohibit the sale of milk from cows not so tested, but if the local health authority is able to produce satisfactory evidence to support his case, the courts are likely to uphold any reasonable local regulations necessary to protect the particular community. There have been several such cases in which the courts have approved local regulations of this character.

The second requirement to be observed by a municipal health authority is that all food establishments of whatever nature, for which regulation is necessary, shall obtain permits or license to conduct their businesses. This gives the health authority opportunity to determine whether conditions in such establishments conform to proper standards, and to refuse or revoke the licenses or permits of those below standard. In a few states local health authorities are limited in their control of food establishments by licensure, because the state has adopted a plan of licensure of commercial enterprises of all kinds as a revenue measure. The purpose of licensure of food establishments by municipal health authorities is not primarily for revenue but rather to provide a means for the enforcement of sanitary laws. If, as in some states, licensing of food establishments for revenue purposes is provided by state authorities, the state laws should prohibit the state licensing agency from issuing licenses to any food establishments except upon approval of the local health authorities concerned.

Given an adequate code of food regulations, and a system of licensure of all food establishments by the local health authority, or by other agency with the approval of the health authority, the next requirement is a system of periodic inspection by trained inspectors which will furnish the health authority with the information which he needs for enforcement of regulations. From the

records of inspection, a program of food inspection may be developed which will economize the time of the inspectors and concentrate their efforts where the need is greatest.

The Procedure of Licensing Food Establishments

We shall later consider the code of food regulations and methods of inspection in the three major branches of food inspection previously mentioned, namely, milk inspection, meat inspection, and inspection of other foods. The procedure of licensing food establishments by the health authority is the same for all three branches, however, and may be briefly outlined as follows:

1. All food establishments or businesses under inspection by the municipal health authority should be required to make application to such authority annually, for license or renewal of license.

2. On receipt of the application, the health authority should make an inspection of the food establishment to determine the propriety of license.

3. If license is approved, the health authority should issue a statement of approval of license to the individual who would receive his license from the city treasurer upon his payment of the proper fee to that officer.

In some cities the practice is for the health authority to issue the license, and collect the fee which is later turned over to the city treasurer. In the writer's judgment, this is not as good a plan as that suggested in the foregoing outline of procedure. The collection and accounting for cash receipts puts upon the health authority a burden which is unnecessary and contributes to certain difficulties in the maintenance of central financial control. The whole procedure is considerably simplified if payments of fees are made directly to the city treasurer. It may be desirable, if the health office and the city treasurer's office are far apart, to permit the applicant to make his payment of fee at the health office and secure his license there, but this is not often the case.

The amount of the fee required of the applicant for a food license should be determined by the nature and extent of the enterprise and the character of the health inspection required to determine the propriety of license. The minimum fee is usually $1, and may be as high as $100 for food establishments whose inspection must be unusually detailed or whose business is of such a character as to make high license desirable. For example, a fee of $1 might be sufficient for a small food establishment,

such as a neighborhood "dairy store." It would not, however, be sufficient for a large establishment producing and handling a great variety of dairy products with perhaps a number of branch stations and delivery wagons. The fee required for license of each type of food business should, of course, be fixed in the health code.

A—Milk Inspection

Since an adequate system of milk inspection requires that milk shall be protected in its production and handling at the dairy, during transportation, at milk depots, and during delivery to the consumer, in fact all along the line from cow to consumer, the code of milk regulations must cover all of these situations. In the great majority of cities the problem of ensuring a clean, safe supply of milk is the same in its essentials, and reasonable uniformity of milk standards is therefore not only possible, but quite practicable. Without such standards milk which might be rejected by one community could be readily sold in another city less particular, and this is by no means an uncommon occurrence where uniform regulations have not been adopted. For this reason, it is desirable that the state laws define in detail the minimum standards of milk production, handling, and sale which may be of general application to all municipal jurisdictions. Local authorities should have authority to make supplementary regulations increasing the stringency of the general regulations defined in the state law, but the state laws should in all cases be so drawn that whatever the local regulations on the subject, the people of all communities will be adequately protected from unwholesome milk.

A great deal has been accomplished in the past twenty years toward bringing about uniform and higher standards of milk regulations, although none of the standards proposed have received universal approval. The first important step in this direction was taken in 1893 when Dr. Henry L. Coit, of Newark, induced the State Medical Society of New Jersey to appoint the Essex County Medical Milk Commission. The purpose of this commission was to provide for thorough inspection of the production and handling of milk by representatives of the commission and the issuance to approved dairies of certificates of merit. Hence the term "certified" milk which, through the creation of similar commissions throughout the majority of states, has resulted in many states in the recognition of "certified" milk as representing the highest standard of raw market milk. In many municipal milk codes

"certified" milk is defined and the method of its certification by medical milk commissions prescribed.

The next important step was the publication by the United States Bureau of Animal Industry of a standard score card for dairy inspection. Although many local communities modified the score card somewhat to conform to what they considered their own peculiar requirements, the standard dairy score card came into quite general use and unquestionably did much to educate both dairyman, milk inspector, and consumer in the essentials of sanitary milk production.

The real basis for uniformity in milk regulations was, however, laid in 1911 when the New York Milk Committee, a local New York City organization, invited twenty sanitarians to become members of a Commission on Milk Standards. The first meeting of this commission took place the same year and it has continued to meet each year since that time. The commission has the complete coöperation of the United States Public Health Service which publishes its reports and these are also endorsed by the American Public Health Association. The standards which this commission has set up have become the basis of municipal milk regulations generally throughout the country and there are few cities which have not adopted some, if not all, of these standards.[1]

Absolute uniformity of municipal regulations governoring the production, handling, storage, and sale of milk and milk products in all parts of the country, is obviously impracticable. Although the aims of the various state laws with respect to the cleanliness and wholesomeness of the milk supply are the same, the factors influencing the maintenance of these qualities in milk may have quite different weights in different states and their communities. It may be quite impossible for one community to enforce the highest standards of milk production and handling without running the risk of putting some of its dairymen out of business and thereby reducing its total milk supply below the quantity necessary to meet the public need. In another city where economic conditions are more favorable to dairymen, it may be possible and practicable to enforce much higher standards. So about all that can be expected of state and municipal governments is that they will enact milk laws and ordinances which set up standards high enough to guarantee public

[1] Commission on Milk Standards, *Summary of Reports of Commission on Milk Standards Appointed by the New York Milk Committee*, Reprint No. 634 from Public Health Reports, 1921.

protection and yet not so high as to make it impossible for their producing dairyman and milk dealers to meet them. A good example of a milk ordinance which fulfills these requirements for one state at least, is that recommended by a joint committee representing the New York State Department of Health and the New York State Conference of Mayors and Other City Officials.[2]

The Grading of Milk

The best municipal milk regulations provide for a classification or grading of market milk. In general, the recommendations of the Commission on Milk Standards relative to milk grades have been accepted by sanitarians as representing the minimum requirements of a clean, wholesome milk supply. Since these recommendations embody the principles on which any milk grading regulation should be based, whether these or higher standards are required, we may well quote from the commission's report:

The commission believes that all milk should be classified by dividing it into three grades, which shall be designed by the letters of the alphabet. It is the sense of the commission that the essential part is the lettering and that all other words on the label are explanatory. In addition to the letters of the alphabet used on caps or labels, the use of other terms may be permitted so long as such terms are not the cause of deception. Caps and labels shall state whether the milk is raw or pasteurized. The letter designating the grade to which the milk belongs shall be conspicuously displayed on the caps of bottles or the labels of cans. The requirements for the three grades shall be as follows:

GRADE A

Raw Milk.—Milk of this class shall come from cows free from disease, as determined by tuberculin tests and physical examinations by a qualified veterinarian, and shall be produced and handled by employees free from disease, as determined by medical inspection of a qualified physician, under sanitary conditions, such that the bacterial count shall not exceed 10,000 per cubic centimeter, at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained shall score at least 80 on the United States Bureau of Animal Industry score card.

Pasteurized Milk.—Milk of this class shall come from cows free from disease, as determined by physicial examinations by a qualified

[2] New York State Department of Health, *Model Milk Ordinance*, February 15, 1923.

veterinarian, and shall be produced and handled under sanitary conditions such that the bacteria count at no time exceeds 200,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacterial count shall not exceed 10,000 per cubic centimeter at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained shall score at least 65 on the United States Bureau of Animal Industry score card.

GRADE B

Milk of this class shall come from cows free from disease, as determined by physical examinations, of which one each year shall be by a qualified veterinarian, and shall be produced and handled under sanitary conditions such that the bacterial count at no time exceeds 1,000,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacterial count shall not exceed 50,000 per cubic centimeter when delivered to the consumer.

It is recommended that dairies producing grade B milk should be scored, and that the health departments or the controlling departments, whatever they may be, strive to bring these sources up as rapidly as possible.

GRADE C

Milk of this class shall come from cows free from disease, as determined by physical examinations, and shall include all milk that is produced under conditions such that the bacterial count is in excess of 1,000,000 per cubic centimeter.

All milk of this class shall be pasteurized, or heated to a higher temperature, and shall contain less than 50,000 bacteria per cubic centimeter when delivered to the consumer.

Whenever any large city or community finds it necessary, on account of the length of haul or other peculiar conditions, to allow the sale of grade C milk, its sale shall be surrounded by safeguards such as to insure the restriction of its use to cooking and manufacturing purposes.

Grades for Small Cities and Towns.—This commission recognizes that because of climate, size of the community, nearness to the sources of supply, ease of transportation, and progress already made in improving the general milk supply, and in educating the dairymen and the public, different communities are in position to secure varying degrees of excellence in their standards for the grades of milk. This commission, therefore, urges that its standards for grades A, B, and C milk be regarded as minimum standards, and that any community may adopt higher requirements for its grades if its conditions make this feasible and desirable.

The commission recommends the same grades for cream, but permits a higher bacteria content, which for 18 per cent cream shall not exceed five times the bacterial standard for the same grade of milk. This rule is generally followed in municipal regulations.

Many municipal regulations provide for a "certified" grade of milk and cream. The standards for this grade are substantially those of A grade raw milk as defined by the commission on milk standards, except that the dairy producing this grade is "certified" by a medical milk commission as maintaining the highest possible standards of production.

Theoretically, perhaps, there should be only one kind of milk, namely, clean, safe milk. Practically, a one standard or one grade milk supply is an impossible requirement for most cities. Milk is the most important article of diet in the whole food category. If one standard of milk quality is insisted upon, that standard must be an extremely high one. In such case it might be impossible for dairymen to meet the required standards and furnish milk at a price that the people could and would pay. This necessitates the establishment of standards for several grades suited to the varying abilities of producers. All grades of milk should be safe for the consumer, but there may reasonably be different degrees of excellence of the product which may accordingly be sold at different prices. It would obviously be unfair to dairymen producing milk of the highest quality not to give them opportunity to command a better price than that for milk of lower quality. The grading of the milk has, therefore, the effect of encouraging dairymen to produce better milk in order that they may attain a higher rating and hence profit by the added price obtained for the better grade.

It will be observed that milk of the grade A quality, as defined by the commission on milk standards, may be of two kinds, raw and pasteurized. The standards for raw milk are considerably higher than those for pasteurized milk. The higher requirements as to conditions of production and bacterial content of raw milk are in a measure offset by the requirement of pasteurization of milk produced under less favorable conditions. But since both the raw and pasteurized grade A milk must attain the same standard of bacterial content before delivery to the consumer, the pasteurized milk is as safe as the raw milk from the sanitarian's point of view, although it is certainly not as good an article of diet for all per-

sons. Pasteurization is permitted in this grade in order that dairymen may attain an A grade rating when perhaps because of local conditions or exigencies of production, the specifications for raw milk production could not be met.

The bulk of market milk is, however, of the B grade since the standards set up for this grade are such as may be readily met by the average dairyman. Pasteurization is insisted upon for all milk of this grade since the minimum bacteria content per cubic centimeter permitted before pasteurization is higher than would be safe in raw milk.

In the case of grade C milk, still lower standards of quality are permitted, since all of it must be pasteurized and its use prohibited except for cooking and manufacturing purposes. Relatively little C grade milk would be required in any but the largest cities where it would be impossible to provide adequate protection for all milk during a long transportation haul and prevent the inevitable deterioration of the product through the many stages of its handling from the dairy to delivery to the consumer. It is probably better not to recognize the C grade at all in most cities, for where it is allowed, it is difficult to prevent its general use.

Such a system of grading as is recommended by the Commission on Milk Standards helps materially in simplifying control of the supply by municipal health authorities. The public is given an opportunity under the grading system to make an intelligent choice of the supply best suited to its purse and its diet. If the demand for milk of highest quality is great, the producing dairies are put to the necessity of improving their equipment and methods so that they may meet the demand. In the majority of cities, milk is handled by large distributing companies, and in order to serve their customers adequately, the distributing companies often find it necessary to provide an inspection service of their own to make sure that the dairies supplying them maintain the required standards.

Other Standards of Milk Quality

As indicated in the definitions of the various grades of milk, the chief determining factor for each grade is the number of bacteria per cubic centimeter. These bacteria may get into the milk in several ways, in the order of their public health significance, (1) from the persons of milk handlers and the equipment used by them, (2) from the cow, either because the animal has disease, or because filth from the cow or stable drops into the milk, (3) from the

adulteration of milk by bacteria contaminated substances, such as water. Milk is an excellent medium for the growth of many bacteria and they multiply rapidly at temperatures above 50 degrees Fahrenheit. According to our best authorities on the subject, milk sometimes contains more bacteria even than are found in sewage. Fortunately, not all bacteria found in milk are harmful to man, and certain of them may be beneficial. By common consent, however, milk containing excessive numbers of bacteria is not regarded as safe, particularly when used for infants. It is practically impossible to produce sterile whole milk, but excessive numbers of bacteria are presumptive evidence at least, that it has been improperly handled or comes from diseased or unclean animals.

But apart from its cleanliness as evidenced by the bacteria count which may vary somewhat according to the different grades, milk of all grades should conform to certain other standards. Briefly these are, that "standard" milk shall contain: (1) not less than 3 per cent butter fat; (2) not less than 8.5 per cent of other milk solids; (3) not more than 88.5 per cent of water in fluids; (4) no foreign substances designed to color, thicken, sweeten, or preserve it.

It is clear that milk which does not conform to the above standards with respect to the percentage of solids and fluids may be perfectly good to drink. Skimmed milk from which the cream or butter fat has been largely removed is not necessarily harmful to health if it is clean; and watered milk may injure the consumer only in his pocket book. On the other hand, since milk is so largely used as food for infants, standards of quality must be set up which will ensure that the milk is good food. With respect to nonbacterial adulterations, the chief danger is that preservatives or other substances may be used to make the milk appear better than it really is or to cloak its deterioration. Some of these adulterants may not be harmful in themselves, but when any are are used, it is to be regarded as presumptive evidence of intent to defraud, or to conceal uncleanliness of milk. Milk may be kept sweet by preservatives which counteract souring from increase of bacteria. The only preservatives needed for milk are cleanliness and cold.

The Use of the Laboratory in Milk Inspection

In order to guarantee the quality of milk, it is necessary for the health authority to provide:

1. Inspection of places where milk is produced, handled, stored, or sold, in order to see that health dangers from disease of cows and milk handlers are eliminated and that the methods and equipment for milk handling conform to established standards.

2. Laboratory tests of milk samples taken from all sources and at all points in the "milk chain" from cow to consumer in order that positive evidence of the quality and cleanliness of milk may be obtained, and to indicate to field inspectors the probable danger points in the milk supply system.

No matter how competent the inspection of places may be, no system of milk inspection which does not include efficient laboratory tests of milk is an adequate system. The grading of milk is based upon the findings of the laboratory with respect to its bacteria content. Whether milk is graded or not, however, the laboratory must determine what milk is safe and what unsafe. The dairy, distributing plant, or milk store may be beautifully equipped, and there may be no evidence apparent to the inspector of any defect of methods or equipment or any disease of milk handlers or cattle, but unless the inspector's judgment is checked by the findings of the laboratory, the community's safety cannot be guaranteed.

In the field inspection of places where milk is produced, handled, stored, and sold, two types of inspection are commonly recognized. The first is inspection of the producing dairies or country milk inspection; the second, inspection of city milk establishments, or city milk inspection. These two inspection services are usually organized as separate though closely coöperating units.

County milk inspection calls for men of special training and experience in dairy practice, and with good knowledge of the care, housing and feeding of dairy cattle. They should be able to recognize the physical signs of disease in cattle and to advise the dairymen in matters of common concern to the dairyman and the milk consumer. This means that they should be men of sufficient technical experience in dairying to discuss the subject intelligently with farmers and to inspire their confidence and respect. The best dairy inspectors are veterinarians.

In city milk inspection the need for technically trained inspectors is not as great, except perhaps in the inspection of pasteurizing plants. Any intelligent, observant layman can become a good city milk inspector with a few weeks' training in inspection essentials. Pasteurization of milk is, however, a process which is highly

technical and the efficiency of pasteurization depends largely upon its supervision by an inspector who is thoroughly familiar with the special equipment and procedure required. In most of the large cities one or more inspectors who are especially qualified for the work are detailed to pasteurization plants exclusively. Routine inspection of other milk handling places requires chiefly frequent visitation and observation of methods of milk handling and the care and cleanliness of equipment. The important thing is for the inspector to have a clear idea of the vital importance of personal cleanliness on the part of the milk handlers. A lack of strict cleanliness in the handling of other food products may not perhaps create any serious health dangers, but a lack of the most rigid cleanliness in the handling of milk may easily prove disastrous.

Good inspection, whether of country dairies, or city milk establishments, calls for the use of score cards which are variously designed for the particular kinds of establishments under inspection. The score card should cover all facts about the personnel, methods, and equipment of the establishment which are the subject of official regulation and a definite rating should be given to each point which is the subject of regulation. The type of inspection record which permits the inspector merely to record his opinion of the establishment as "good," "fair," or "bad" is not of great value, because it permits carelessness of inspection and does not bring out clearly the facts on which such judgment was based.

The dairy score card in common use is that recommended by the United States Bureau of Animal Industry. Many cities find it necessary to modify the form somewhat in order to meet their peculiar local situations. For example, a dairy score card which would meet well the conditions to be found in a northern state where cattle are housed many months of the year, would not meet the conditions in a southern state where cattle are at large practically all the year round. In general, dairy score cards are designed to cover in more or less detail the physical condition of milk handlers, the physical condition of cattle, the equipment of the dairy, including facilities for the sanitary care of cattle and milk, and the methods of handling milk. In many cities where the score card is used, a total score below 50 is regarded as evidence sufficient to warrant the exclusion from the city of the milk from such a dairy. The dairy score must not be considered as always reliable evidence of the cleanliness of milk. The writer has seen many dairies which, if scored by any of the accepted methods,

would rate very low indeed in equipment, perhaps low enough to bring the total score below the desirable minimum standard. Yet bacteriological tests of milk from some of these dairies showed the milk to be of highest quality. Where milk handlers and cows are clean and healthy, and utensils are clean, milk of low bacteria count can be produced with equipment of the simplest character. This fact merely emphasizes the necessity of having good laboratory tests of milk as a check upon the findings of inspectors. It would be a silly exercise of health authority to exclude the milk of a certain dairy because it did not come up to certain arbitrary standards of equipment, provided it produced milk bacteriologically clean.

Brainerd and Mallory, bacteriologists of the highest standing, are quoted as concluding from their studies of bacteria counts in relation to dairy scoring that "The score card is defective when used as a measure of the sanitary properties of milk. These experiments show clearly that it is possible to produce good milk under conditions which would give a score below any effective standard which might be established. . . . The chief difficulty of the score card is that as a measure of the sanitary properties of milk, none of the points scored have a permanent value under all conditions and it is questionable whether they have a definite value under any given set of conditions."

Special score cards are also devised by many cities to cover conditions in milk bottling and pasteurizing plants, ice cream plants, retail milk stores, and other places. The type of score card to be used for each kind of establishment must necessarily depend upon the features on which local regulations have been enacted. It is of no particular value to call for a specific rating upon conditions in such establishments if no criteria for the ratings have been established by law. Too much is left under such circumstances to the mere opinion of the inspector. As in the case of dairy scores, it is necessary to check the inspector's findings and his rating of the establishments by frequent laboratory tests of the milk.

Since the most important fact about milk is the condition of the milk when it reaches the consumer, every source of supply to the consumer, from the distributing company which delivers milk at his home, from the retail milk depot or store which sells milk to him over the counter, from the restaurant which furnishes milk by the bottle or glass, from the soda fountain, and elsewhere, must be subjected to frequent sampling. It makes little difference how

pure and wholesome the milk is when produced if it is contaminated by the time it reaches the ultimate consumer. Sampling of milk should be general and frequent from all these sources, and if this is done it will be apparent from the laboratory's findings where greatest watchfulness is needed. The extent to which the sampling procedure is carried out determines in large measure the efficiency of control.

The procedure commonly followed in the use of score cards calls for a triplicate record. One copy of the score is given to the dairyman or dealer for his advice, one is kept by the inspector for his information and follow-up, and a third copy goes to the departmental files as the permanent record. As establishments are reinspected and scored, the copies of subsequent score records kept by the department should be filed chronologically under the name of the dairy or dealers concerned. In many cities the chief milk inspector, or head of the milk inspection service, keeps charts on which all producing dairies and other milk establishments are listed. As they are scored and rescored, the essential facts disclosed and the final rating is entered as made, so that at any time the health officer may have for his review a complete picture of the results of milk inspection. From such charts the chief milk inspector is able to lay out the work of his field force so that their time may be conserved and inspection centered where the need appears greatest.

Relative Values in Milk Inspection

Good dairy inspection is useful in milk control, not so much because of its effect on the enforcement of standards of milk quality as because of its educational value to the dairyman. Many dairyman, like other citizens, do not appreciate fully the importance of milk cleanliness to the public health. There are probably very few dairymen who would willingly expose the public to disease dangers if they knew what these dangers were and how they might be avoided. The dairy inspector's most important duty is, therefore, to inform the dairyman and enlist his coöperation for community health. If milk is graded so that his compliance with higher standards of production gives the dairyman a commercial advantage this has the effect of stimulating his effort to improve his methods and equipment.

The difficulty in providing good dairy inspection for communities whose milk supply is obtained from a wide rural area is that

the cost is likely to be prohibitive. Many large cities obtain their milk supplies from sources scattered throughout their respective states and even throughout adjacent states. To be most effective, dairy inspection should be made twice a year, at the very least. Even where the dairies are visited only twice a year, the cost of such inspection to cities having several thousand supplying dairies is well nigh prohibitive. In the small cities where the supplying dairies are in the immediate neighborhood and readily reached by an inspector in an automobile, supervision of milk production can be provided at relatively small cost. Some of these cities have found that under such favorable circumstances, they can obtain a clean, wholesome milk supply without pasteurization, a practical impossibility for most of the great cities of the country.

The present trend in milk inspection in almost all large cities is toward less frequent country dairy inspection which is so costly, and greater frequency of laboratory tests of the milk as it comes to the consumer. Many able authorities, while conceding the educational value of dairy inspection, believe that a great deal of time and money has been wasted by over emphasis of country dairy inspection as a routine performance. Dr. Charles E. North, and others, who have given considerable thought to the subject of municipal milk sanitation, suggests a reorganizaton of milk inspection service in which the laboratory shall determine where and when dairy and other inspections shall be made. As Dr. North expresses it:

> The only considerations worthy of the attention of the health officer and sanitarian are those that affect the milk itself, and there is no way in which the dairy or milk handling can affect or contaminate milk without such contamination being reflected in that most delicate of tests we call "the bacterial count." Experience in dairy inspection has clearly shown that when the bacterial count is consistently low, milk contaminations are regularly prevented and efficient refrigeration is practiced; and, on the other hand, where bacterial counts are high, sanitary methods of prevention are neglected, contamination takes place, and efficient refrigeration is not carried out. . . .
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> The work of the inspector can be made intelligent and efficient only by the bacterial testing laboratory. The foundation of any inspection system should be the laboratory service. The testing of milk should precede the inspection of the dairy. The testing of milk samples at once divides the products into two classes, sanitary and insanitary. The source of supply being known, the inspector's attention can at

once be directed to the place from which the insanitary milk is being shipped. . . . In place of a territorial distribution of inspectors, such as is often provided by large municipalities, and a periodic inspection of dairies irrespective of the character of milk produced, the consolidation of the laboratory service with the inspection service transforms the inspection force into a flying squadron, quickly concentrated if need be upon such portions of the municipal supply as the laboratory discovers is most insanitary. . . .

In . . . plans for the expenditure of the annual appropriation for milk control, the milk dealer as well as the health officer should bear in mind that the laboratory worker can test the milk of fifty dairy farms for bacteria while one dairy inspector in inspecting five dairy farms, and that therefore one dollar spent in laboratory testing covers as much territory as ten dollars spent in dairy inspection. The laboratory test should come first and make the diagnosis; the dairy inspector should come second and apply the remedy.[3]

Whether it is better in any given community to adopt the plan suggested by Dr. North, or to carry on routine country dairy inspection in the time honored way, depends upon local circumstances. The dairy inspector's chief service is, as we have said, in the education of the dairyman. It would certainly be an uneconomic use of funds in any case to employ for routine country dairy inspection a corp of inspectors who were not adequately trained and equipped for such educational work. If they were well trained and sufficient in number to cover the field adequately, there would be little reason for discontinuing routine dairy inspection except on account of costs. On the other hand, if the cost of providing competent routine inspection were excessive and out of proportion to the milk control value of the inspection, it would be the part of good sense to spend public funds instead for more frequent laboratory tests and an inspection service based on laboratory findings according to the plan suggested by Dr. North. For the largest cities where the number of producing dairies supplying the community frequently runs into thousands and their location is widely scattered perhaps over several states, it would undoubtedly be more productive in control to make the laboratory the starting point of inspection instead of the terminal, as it is in the great majority of cities. Yet the writer has studied dairy inspection in many cities where, through the efforts of well trained

[3] Charles E. North, "Bacterial Testing Versus Dairy Inspection," *American Journal of Public Health,* June, 1916.

dairy inspectors and their use of the dairy score card, standards of milk production and handling in dairies have been maintained which could not possibly have been maintained by any other type of inspection. The frequent personal contact between an intelligent, tactful representative of the health department and the dairyman has an effect which no other system of inspection can guarantee. The more remote the dairy from the community which it serves, the less, however, the dairyman will be concerned about the community's health problems. That is to say, if the dairyman lives within a few miles of the city which he serves, and his own interests are closely bound up with the city's interest, the greater will be his concern about the cleanliness and wholesomeness of the milk which goes to the city from his establishment.

The argument for and against continuance of routine dairy inspection and scoring in small communities with nearby dairies may be briefly summarized as follows:

1. In small cities where dairies are nearby, routine dairy scoring can be done frequently and without excessive cost.

2. The health educational value to the dairyman of frequent scoring of dairies which are in close proximity to the communities which they serve, is sufficient to warrant continuance of this procedure for such dairies.

3. In large cities where the location of many dairies is such as to make frequent inspection and scoring impracticable except at excessive cost, the procedure may well be discontinued, except for those dairies which are relatively nearby. For other remote dairies inspection should be limited to those which are shown to be in need of it by laboratory test of their product.

Milk and Infectious Diseases

As already noted, milk is an excellent medium for the growth of many disease causing bacteria. The chief milk born diseases in this country are tuberculosis, typhoid fever, septic sore throat, diphtheria, and scarlet fever. Milk containing large numbers of bacteria of various kinds, even though the bacteria may not cause any of the specific diseases above named, may produce serious inflammation of the gastrointestinal tract, particularly of infants. These intestinal diseases are variously called cholera infantum, dystentery, diarrhea, and enteritis. We have indicated the significance of these intestinal disorders as causes of child deaths. The specific bacteria of most of these diseases get into the milk

chiefly from the persons of milk handlers. Tuberculosis, however, is a disease of cattle as well as of man, and although there are essential differences between the bovine and human type of the bacilli, bovine tubercule bacilli may enter the milk directly from the cow, and produce tuberculosis in the consumer of the milk. The chief danger of milk so contaminated is to children because they are more susceptible to the disease and drink a great deal of milk. The bovine type of tuberculosis quite often produces tuberculous meningitis, tuberculous lymphatic glands, tuberculous bones and joints, and a great variety of conditions among children which were formerly spoken of as "scrofulous." Scrofula was the "king's evil" of the Middle Ages.

It is probable that pulmonary tuberculosis is only rarely caused by milk contamination—at least, there is little direct evidence to this effect. It is possible that when persons with active pulmonary infections come in contact with milk and deposit the bacilli directly in the milk, the disease may be transmitted to others, but the weight of evidence is that this mode of infection plays a minor part in the spread of pulmonary tuberculosis.

In the other specific diseases named, the bacteria get into the milk directly from the person of the milk handler, or occasionally indirectly through the introduction into the milk of substances, such as water, which contain the bacteria. Except tuberculosis, none of the specific diseases mentioned, as far as present knowledge goes, exists in cattle. Human carriers of these diseases are probably responsible, in most instances, for the contamination of milk. The presence of the typhoid bacillus in milk is positive evidence that in some way, directly or indirectly, the milk has been contaminated by the bowel or urinary discharges of a person having a typhoid infection. Similarly, milk handlers having in their noses or throats the bacteria causing sceptic sore throat, diphtheria, and scarlet fever, may contaminate the milk directly or indirectly with the infective discharges from the parts of the body affected. There are doubtless many other serious diseases which may be milk borne under certain circumstances, but from the point of view of milk cleanliness and safety, the procedure of control is the same.

Milk sanitation requires the application of certain well established measures directed, particularly, toward the prevention of milk contamination by the bacteria of the specific diseases mentioned. These measures are:

1. Cows should be healthy and their freedom from tuberculosis should be guaranteed by the tuberculin test which identifies the existence of bovine tuberculosis.

2. All persons who in any way come in contact with milk destined for consumption by others should be certified as free from communicable disease. This applies particularly to carriers who may show no physical signs of infection.

3. Strict cleanliness of the person of milk handlers, and of their utensils and equipment, should be insisted upon.

4. Milk should be protected from dust and dirt, and should be kept below 50° F., from the time when drawn to delivery to the consumer. Bacteria of disease do not multiply rapidly at such temperatures.

5. Pasteurization should be provided for all milk which is so produced or handled that the safety of the milk cannot otherwise be guaranteed.

The measures above defined relative to the health of cows and milk handlers, the care and cleanliness of equipment, and the cooling of milk are enforceable within limits by inspection backed by frequent laboratory tests of milk samples, and diagnostic tests also, to determine the presence or absence of disease of cattle and milk handlers. We say these measures are enforceable within limits because it is obviously impossible for any scheme of inspection to provide such surveillance of milk handling at all times and in all places as to prevent contamination. For this reason pasteurization or heating the milk so as to destroy dangerous bacterial growth in it, is regarded as an essential of milk control in all large cities. We shall speak later of the physical examination of food handlers since not only milk, but many other foods, may easily be contaminated by persons having communicable disease.

Sediment or Dirt Testing of Milk

Practically all milk contains some dirt which gets into it in its handling in one way or another. The greater part of the gross dirt in milk, which has not been strained or otherwise clarified, is cow manure. The amount of gross dirt, and by that is meant visible dirt, is therefore, a fairly good measure of the care taken in handling it. Milk that contains visible dirt is almost invariably of high bacteria count.

To determine the amount of gross dirt in milk, it is only necessary to strain it through a disk of absorbent cotton. There are

several types of apparatus on the market for testing milk in this way, and many health departments make the test as a matter of routine because of its educational value to dairymen. The dirt stained cotton discs, through which the milk has been passed, are sometimes mounted upon cards and sent to the dairymen as visible evidence of their lack of cleanliness. Sediment testing is not to be regarded as a substitute for the bacteriological tests of milk. The dairyman, if he is clever, may remove much of the gross dirt from his milk by straining it through a fine cloth. He cannot remove the bacteria by this means.

In Rochester, New York, where sediment tests of milk were being made at the time of the writer's study, the cotton disk through which the dirty milk had been strained, was pasted on a card by the side of another cotton disk representing clean milk. In cases where the test disk showed a dirty condition of the milk, the following letter was sent to the dairyman.

On (date), milk sold by you was subjected to tests which show it to be very dirty and unfit for human food. This milk must not come into Rochester. By order of the health officer you are hereby notified to appear at the health office and show cause why your license should not be revoked for selling milk in violation of the health ordinance.

When the dairyman appeared at the health office, the evidence of his uncleanliness in the tell-tale dirty cotton disk was usually sufficient to convince him of the necessity for improved methods.

Where adequate laboratory facilities are available, it is, perhaps, somewhat of a waste of health employees' time to test milk samples in this way, as a routine matter. It is, however, a good plan for small cities lacking adequate means for frequent bacteriological tests. The evidence thus obtained gives the health officer an excellent argument in support of requests for funds for the needed laboratory personnel and equipment.

The Pasteurization of Milk

The word pasteurization indicates the contribution of Pasteur, the great French bacteriologist, to milk sanitation. Pasteur discovered that the bacteria which caused deterioration of wine and beer in France, and consequent grave economic loss, could be destroyed by heating. The use of Pasteur's name is, therefore,

recognition of the application of this discovery to the destruction of bacteria in milk.

Pasteur's discovery was not applied in milk sanitation in this country in the control of commercial milk supplies until the period 1890 to 1900, and then only in a few places, and without official recognition by health authorities. As first carried on in this country by a few commercial companies, the heat treatment of milk was by the "flash" system, which consisted merely in raising the milk temperature from 60° to 70° C., momentarily, and then quickly cooling it. This was found to be sufficient to prevent rapid souring of the milk due to the multiplication of bacteria, and when such treatment was given milk, this was the chief aim.

Although it was early proved by many competent investigators that pasteurization of milk for infants was extremely effective in preventing many infant deaths from intestinal disorders, there was a good deal of opposition to the practice. It was believed by a large number of physicians and public health authorities that the heating of milk impaired its food value materially, and there was considerable popular prejudice against it as a device used by commercial dealers to make bad milk salable. The flash system of pasteurization first used was not effective in operation generally, and this also contributed to hold back its endorsement by milk producers and distributors.

In 1906, Rosenau demonstrated that all of the bacteria of communicable diseases in milk are destroyed when the milk is heated to 60° C., and held at this temperature for twenty minutes. In the same year, North demonstrated that neither the rising of cream nor the taste of milk was affected by heating to temperatures below 65° C. Although these demonstrations gave considerable impetus to the movement for commercial pasteurization, there was not at this time any equipment for the purpose available to commercial milk dealers. Due to the efforts of North, Rosenau, and others, manufacturers soon had on the market equipment for the pasteurization of milk by holding the milk at a temperature of 60° to 65° C. for a period of twenty minutes or more. This type of equipment for pasteurization by the "holding" method rapidly displaced the older "flash" treatment equipment, and to-day practically all commercially pasteurized milk is treated by the "holding" method.

The name of Nathan Straus, philanthropist, of New York, should be remembered in connection with the pasteurization move-

ment. In 1893, Mr. Straus established infant milk depots in New York City at his own expense for the distribution of pasteurized milk to infants, and continued to maintain them until 1919. The establishment of these stations contributed greatly to the reduction of infant mortality in New York, and in other cities, where similar milk depots were established. It contributed also to overcoming the popular prejudice against pasteurization.

To-day practically all cities of the first class require pasteurization of their milk supplies, in whole or in part, by the holding method. There are still many small cities, however, where such control has not been put into effect, either because of the ancient prejudice against the procedure, because small dealers are not financially able to provide the necessary equipment, or because clean milk can be guaranteed without pasteurization. The growth of the large milk distributing companies, and the gradual elimination of the practice of the individual dairyman selling his own product direct to the consumer, has materially hastened the adoption of municipal regulations requiring pasteurization. For many small cities, where it is difficult to require pasteurization by the individual dairyman, or to guarantee its efficiency when carried out, the municipal pasteurizing plant is, perhaps, the most satisfactory solution of the problem of milk sanitation. Such a plant was put into operation in the city of Tarboro, North Carolina, in 1918, and to date has been conducted successfully under municipal auspices.[4] The entrance of municipal government into this field should, we think, be limited to those cities where private enterprise is not willing or not prepared to maintain satisfactory pasteurization facilities. But this raises questions of municipal ownership which we are not concerned with here.

Pasteurization, as defined by the commission on milk standards, calls for the heating of milk to a temperature of 145° F., and the holding of the milk at that temperature for thirty minutes. This is the standard which should be required in municipal regulations, and pasteurization is to be regarded as efficient only when the standard is rigidly maintained. Overheating the milk may damage it for food purposes; underheating it may not result in the destruction of the bacteria of disease. So thorough supervision of pas-

[4] K. E. Miller, "A Demonstration at Tarboro, North Carolina, of a System for Sanitary Control of Milk Supplies of Towns and Cities, with Special Reference to the Operation of a Municipal Pasteurizing Plant," *Public Health Reports*, November 6, 1925.

teurizing plants is absolutely necessary to good health control Modern pasteurizing equipment in commercial use is fitted with automatic time and temperature recording devices which show exactly when the required temperature was reached and how long it was maintained. When such devices are used, and in good working order, sanitary control of the process is more readily guaranteed. The usual procedure is for the health officer to require that the time-temperature record of pasteurization in each plant be submitted to him daily as a check on the efficiency of the process. The recording apparatus registers on a removable paper dial, the rise of temperature and the time maximum temperature is maintained. These dials are filed in the health office along with the records of the inspector's observations, and the bacterial tests of the milk after pasteurization.

Pasteurization by the holding method is of two general types. The first type provides for the heating of the milk in a tank or series of tanks; the second, the heating of the milk in the bottle. The latter method is the better, but the more expensive.

Inspection of Pasteurizing Plants

Since pasteurization is a process which, to be effective, must be carried out according to approved standards and with scrupulous attention to the prevention of contamination of milk after pasteurization, thorough inspection of pasteurizing plants is an absolute necessity. The inspectors must be highly intelligent men, thoroughly familiar with the mechanical operation of equipment, and keenly observant of methods. Inspection of pasteurizing plants, and this includes the necessary laboratory tests of milk, should be directed to the following points:

1. The condition and handling of the milk prior to the pasteurization. If grading regulations are in force, the bacteria content of the milk before pasteurization is of particular importance in determining grades. Frequent sampling of the raw milk is, therefore, necessary.

2. The pasteurizing equipment, and its care and use, so that the required standards necessary for complete pasteurization may be maintained.

3. The health, cleanliness, and personal conduct of employees who come in direct contact with the milk, before, during, and after pasteurization. Milk is often contaminated by unclean or careless employees after pasteurization.

4. Methods of cooling milk and its handling otherwise after pasteurization, and before delivery to the consumer. The mere fact that a bottle of milk is labeled as pasteurized does not guarantee its safety, if faulty or fraudulent practices in its labeling or treatment subsequent to pasteurization are not prevented.

Bacteriological tests must constantly be relied upon to check the efficiency of pasteurization at all stages of the process. Without such check, the reports of the inspector at the plant, no matter how competent or trustworthy he may be, are inadequate to guarantee milk safety.

The following citation relative to the inspection of pasteurizing plants emphasizes the need of laboratory control of the process, and personal observation of procedure by competent trained inspectors.

A number of milk plants in which milk was pasteurized and bottled were seen. In each case the type of plant was such that the pasteurization process could be properly performed, and in many of the biggest ones the machinery itself was designed to eliminate as much as possible the chances for contamination. It must be recognized, however, that even in the best plants personal care and cleanliness on the part of the attendants is a factor of great importance. The best pasteurizing process can be spoiled and the milk contaminated if the greatest care is not taken in the handling. If the department, therefore, is to be justified in giving permits to those plants and assuring the public that the milk is safe, the department must visit these plants with great frequency and keep them under continuous observation.

The department is not at present in a position to give this assurance, although there is a sufficient number of pasteurizing plants to handle the milk supply. In the first place, the most reliable test that can be made to determine the safety of the milk, namely, the bacterial count, cannot be made by the department because of a lack of milk testing laboratory. The present ordinance prescribes that unpasteurized milk shall not be sold containing more than 50,000 bacteria per c.c. It is, therefore, incumbent upon the department to strengthen its milk inspection. At least one competent inspector and, as soon as appropriation therefor can be obtained, two inspectors should be assigned to inspect pasteurizing plants. These inspectors should be thoroughly acquainted with the best pasteurizing methods and equipment.

The necessity of such constant inspection was clearly seen during visits to the plants. In many cases, window and door screens had

not been put up sufficiently early, or had not been put up at all, and flies had found their way into the milk vats, and the milk had to be strained so as to prevent their entrance into the final container from which the milk was bottled. In too many instances the lids of the vats were left open or raised, a reprehensible practice because it gives entry to flies and dirt. In one case, the caps were put on the filled bottles by hand. These lapses are due more to ignorance than to wilful carelessness on the part of the handlers, and can be overcome only by constant inspection.[6]

The writer once accompanied a health department inspector on a visit to a "model" pasteurizing plant. The building was beautifully designed and perfectly arranged. Its equipment was the best, and it was kept in an immaculate condition. The workmen were, apparently, clean, capable men, and the casual observer would have said that conditions were as nearly perfect as human hands could make them. As the pasteurized milk was drawn from the tanks into the bottles, and capped by the machine, it was noticed that here and there a workman would pick up a bottle before it was capped, take a hearty drink, and replace the bottle in the machine for capping. The attention of the inspector was called to this procedure as one which might seriously contaminate the pasteurized milk in the bottles so dealt with. He was frank to admit that he had never noted this before, and he took immediate steps to stop it. This inspector was a man of high intelligence, and a good inspector, but he was so accustomed to a routine inspection of the plant, and so convinced that it was in all respects a "model," that this small, though potentially dangerous defect in procedure had never been observed, although it was probably the common practice in early morning hours. The community health might not be seriously endangered by workmen in this way, but it is certain that the consumer should have assurance that his own lips are the first to touch the milk which comes to his table. Such a situation is probably not of frequent occurrence; it is cited here merely to illustrate the necessity for constant watchfulness, even in the best equipped and best conducted plants.

Dipped Milk and Its Dangers

By dipped milk is meant milk which is dipped by the dealer from a container and poured in the customer's pail, bottle, or

[6] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Indianapolis, Indiana*, 1917 (printed), pp. 347-348.

glass, as the case may be. The practice of selling dipped milk at retail stores is still permitted in many cities, although nothing can be said in its favor, except that the cost is less than when milk is sold in bottles. The customer cannot know, however, what he is getting; the health authority cannot exercise satisfactory sanitary control of the handling of milk in such places; and the milk is quite likely to be exposed to serious contamination in the dipping process. Dirty utensils may be used by both buyer and seller; the milk may be exposed to dust and dirt; it may not be kept cool at all times. The usual procedure is for the dealer to hold the customer's container in one hand over the top of the milk can, dip up the milk from the can with a long-handled dipper and pour it into the customer's pail or bottle, letting the overflow run back into the can. It is apparent that this procedure is likely to carry dirt into the supply can from the customer's container, and possibly from the dealer's hands. Dipped milk is also frequently dispensed at restaurants, soda fountains, and lunch counters and, although less likely to be contaminated there by improper handling or dirty receptacles, the practice should be discouraged. The only really safe plan is to require that milk shall be served to the consumer in the original bottle after it has presumably been made safe by pasteurization or otherwise. In restaurants and soda fountains, the next safest plan is to require that milk be drawn into the customer's glass from a container equipped with a faucet. The only difficulty with the latter procedure is that unless the milk is occasionally stirred, some customers will get only skimmed milk.

In the largest cities, it is extremely difficult for economic reasons to prohibit the sale of dipped milk and yet it is practically impossible to enforce strictly the necessary regulations, except at a cost which is prohibitive for many communities. When health authorities find it desirable to permit the sale of dipped milk in small milk depots, groceries, delicatessen stores, bakeries, etc. in order to encourage wider consumption of milk, a detailed code of regulations should be devised covering the following points.

1. Health and cleanliness of milk handling employees.

2. General sanitary conditions of premises, especially with respect to cleanliness of store equipment, toilet facilities, disposal of refuse, proximity to privies or stables, screening, protection of food from flies, other insects, and animals, etc.

3. Refrigerating facilities for keeping milk separate from other foods, unexposed to dirt, and at proper temperature at all times.

4. The type of utensils used with respect to their adaptation to protection of the milk and to satisfactory cleansing.

5. Facilities for cleaning equipment, including an adequate supply of hot water.

6. Methods of dipping milk, cleansing receptacles, sweeping, dusting, etc.

The regulations thus devised should be printed in large type, and conspiculouly posted on the premises so that the dealer may know exactly what is expected of him, and the customer, what he ought to expect from the dealer. Inspection by the health authority should be as frequent as possible, and the public should be advised that complaints of improper practice by dealers will receive the prompt attention of the department of health. Score cards should be used in the inspection of all such establishments, and the scoring should be based upon the regulations covering the points above listed.

Standards for Milk Products

Although the health dangers from bacterial contamination of milk products, such as butter, buttermilk, ice cream, condensed milk, cheese, dry and powdered milk, etc., are not as great as in the case of standard milk, they are great enough to warrant health authorities in giving attention to the quality and cleanliness of these products. Laboratory tests should be made from time to time to determine whether or not they are wholesome. The Commission on Milk Standards has prescribed standards for such products and the recommendations of this commission should be the basis of municipal regulations. In general, these standards are based upon those recommended by the commission for the various grades of milk and cream from which the products are made. These grades have already been fully described.

Of the milk products mentioned, butter and ice cream are probably of chief importance in their bearing upon public health. Milk which is prohibited for sale in many cities because of high bacteria counts, often gets into those cites in the form of butter and ice cream. Bacteria grow more prolifically in milk than in butter and ice cream, and the amount of the latter foods consumed is considerably less than that of milk. Nevertheless, butter and ice cream, which are highly charged with bacteria, are probably a greater menace than is commonly believed. The following excerpt illustrates the effect which may be produced by rigid

enforcement of high standards for milk and cream and the lack of enforcement of suitable standards of butter:

> Because of the strict enforcement of milk standards by the local health authorities, a situation has arisen which is believed of menace to the health of the community. Three dairies, the milk from which was recently excluded from the city because of dangerously high bacteria counts, are now selling this same milk to a manufacturer of butter within the city. Milk and cream containing from 2,000,000 to 20,000,000 bacteria per cubic centimeter are now being consumed by Jamestown citizens in the form of butter. This matter is already under consideration by the health board which is endeavoring to establish its legal right to prevent the use of such milk for any kind of food purposes. It is believed, however, that it is well within the power of the local board of health to prohibit the action of these milk dealers in thus disposing of this dangerously contaminated milk, and it is urged that such action be taken at once. Powers of health authorities in emergency are very broad, and it is not believed that in any emergency such as this, the board of health should wait for a long delayed legal opinion, for in the meantime the unclean butter is being sold.[6]

Of the various communicable diseases, typhoid fever and tuberculosis in certain forms are the ones most commonly transmitted through the media of ice cream, butter, buttermilk, and fresh cheese. Although relatively few cases of such diseases have actually been traced to these sources, there is sufficent evidence to indicate the need for better sanitary regulation of the manufacture of these products. Apart from the insistence upon proper standards of bacteria content of the milk from which the products are made, there is need for the health examination of those concerned in their making.

In the sanitary control of the manufacture and sale of milk products, it is clear that, although some evidence of the cleanliness and quality of such products may be obtained by inspection of the places and methods of their manufacture, the only reliable index of their suitability for food is the laboratory test. Routine inspection of equipment, and methods in such places should be made as in the case of milk establishments, generally, for purposes of general sanitary control, but frequent sampling of their

[6] New York Bureau of Municipal Research, *A General Administrative Survey of the City of Jamestown, New York,* 1916 (printed), p. 183.

products should be the rule. Score cards should be devised for all such establishments.

Public Education Regarding Milk

Since a large share of work of protecting the milk supply depends upon the coöperation of the public, it is highly desirable that the health authority make special effort to keep the public fully informed on the subject. To this end all possible means of education should be used including the publication of dairy scores and bacteria counts of milk in newspapers and department bulletins where this is practicable; the issuance of special pamphlets on milk cleanliness and care, and its advantages as an article of diet; the publication in the newspapers of special news articles on milk and milk inspection. There are, on the market, several excellent moving picture films on milk production and sanitation, which may be used to advantage by local authorities. Several types of small cheap moving picture machines are now available with which health officers may make their own "movies." Small traveling exhibits for installation in the schools and other public places are also useful.

In any city where there are well organized private health agencies, the health authority should make special effort to secure their coöperation in the health educational program. Many of these agencies have direct contact with the home and every such contact furnishes an opportunity for health education of its inmates. The school also can be of great service in spreading the gospel of clean milk, for this is a subject which can be made extremely interesting to children as a theme for classroom instruction and essays. Some of the large commercial organizations, such as the Metropolitan Life Insurance Company, have made excellent contributions to popular literature on the subject of milk. The milk pamphlets published by the company named are particularly good for school and home use, and may well be utilized by health officers as a guide in preparing similar pamphlets on the subject.

State health departments usually publish special educational matter on milk sanitation which is available to local health authorities for distribution under their own imprints. The United States Public Health Service also publishes a large amount of material on all phases of milk sanitation, which can be obtained free or at a very small charge. The amount of available educational matter on milk sanitation published by official and unofficial

agencies is so great that it seems almost impossible for any one to be ignorant of its aims and methods, yet there is in every community a vast amount of ignorance and misinformation about milk sanitation which contributes to official inefficiency, and the public danger. Milk "scandals" could not possibly occur in our cities so often but for public ignorance about milk.

Summary of Methods of Good Milk Control

The sanitary control of municipal milk supplies depends upon the following factors:

1. The enactment of ordinances establishing standards of milk and milk products based upon the general standards endorsed by the Commission on Milk Standards with such modifications only as are essential to meet peculiar local situations.

2. The employment of a corps of competent milk inspectors under the direction of a chief inspector or other experienced officer, and their assignment to country and city milk inspection according to need.

3. The licensing of all establishments producing or otherwise handling milk and milk products only after inspection and approval of their personnel, plants, and equipment.

4. The use in routine inspection of score cards requiring specific information on the personnel, equipment, and methods of the establishments in question, such score cards to conform as far as practicable to those recommended by the United States Bureau of Animal Industry and the Commission on Milk Standards.

5. The maintenance of a properly manned and equipped laboratory for the frequent testing of samples of milk and milk products in order to prevent violation of regulations and also as a check upon the efficiency of routine inspection of premises.

6. The concentration of inspection effort where the need is greatest, as evidenced by the laboratory tests of milk and milk products.

7. A thorough campaign of public education on milk sanitation and its importance, particularly in child health protection.

B. Meat Inspection

The dangers to health from the eating of meat, contaminated either by organisms of disease, or products of decomposition, are by no means as great as in the case of disease infected or decomposed milk. Nor are the other adulterations of meat commonly

as serious a menace to community health as the adulterations of milk. Meat is not a food extensively used by children; it is, in most instances, cooked before being eaten, and the organisms of disease, if any, may thereby be destroyed. Besides there are relatively few diseases of animals used for food purposes, which are readily transmissible to man in meat or meat products.

Tuberculosis of cattle is the most important of the animal diseases which may produce disease in man, chiefly because it is so common in cattle, and because the bovine bacillus of tuberculosis is not easily destroyed in meat, except by thorough cooking. The other diseases of animals are of many types, but to most of them man is not susceptible, at least, to infection through meat eating. It is doubtful if any animal slaughtered for food purposes is wholly sound and free from disease. Parasitic infections are quite common in most all food animals, and of these the beef and pork tape worms are the most common and most dangerous to man, particularly when meat is eaten uncooked or only partly cooked. Hogs suffer from hog cholera, an acute infectious disease, quite fatal to hogs, but not transmissible to man, although meat from cholera infected hogs should be excluded from sale as a matter of public health policy. Anthrax is another serious disease of cattle communicable to man in food, and also through the handling of meat and hides of infected animals. The disease is, fortunately, comparatively rare in cattle slaughtered for food purposes. Actinomycosis is another serious but rare disease of cattle which is dangerous to man. There are also many other infectious diseases of animals, and many degenerative conditions of one kind or another which make meat unfit for food, although they may not directly cause disease in man.

Man's health may be endangered also by eating decomposed meat or meat containing toxic substances produced in the animal as the result of bacterial action. Ptomaine poisoning may result from the eating of putrefied meat or any other putrefied protein food. Most so called ptomaine poisonings are probably acute infections from microörganisms of the para typhoid or typhoid-like group. Botulism, another poisoning which derives its name from the Latin word *botulus,* meaning sausage, often produces fatal results in man. It is an intoxication due to the creation of a poison in meat, meat products, and certain vegetables as the result of the growth of the *bacillus botulismus.*

Fish, also, have certain infections which are communicable to

man, but human sickness from the eating of fish is comparatively rare in this country, because fish is usually thoroughly cooked before eating. In certain foreign countries, where fish is eaten raw, parasitic diseases of fish are frequently found among the fish eaters. Fish spoil quickly, and their decomposition produces poisonous substances which may cause serious sickness, but, fortunately, there is usually sufficient evidence of decomposition to warn the consumer against spoiled fish.

Shell fish are also dangerous when undergoing putrefaction. The most important fact about shell fish from the public health viewpoint is, however, that when grown in polluted waters, they take up large quantities of bacteria which remain virulent for a long time. Typhoid fever and cholera epidemics have both been caused by eating oysters grown in sewage polluted beds. Several severe epidemics of typhoid fever along the Atlantic seaboard have been clearly traced to oysters.

In general, it may be said that municipal meat inspection has three chief phases, namely, (1) the inspection of cattle at slaughter, and the sanitary conditions of abattoirs; (2) the inspection of meat products and of sanitary conditions in the plants manufacturing them; (3) the inspection of meat, meat products, fish, and oysters, as stored, sold, or offered for sale in wholesale and retail stores, and the sanitary conditions of such places. It should be remembered that all articles of food in interstate commerce are subject to inspection by the federal authorities. Since much of the meat, meat products, fish, and oysters sold in the average community are shipped from points outside the state, the municipal authorities are relieved of a great deal of responsibility for inspection.

As in the case of the sanitary control of milk, the first steps in meat inspection are the enactment of a comprehensive code of regulations governing all phases of wholesale and retail handling of meat according to approved standards, and the licensing of such places. The federal government has established standard regulations governing the operation of meat establishments doing an interstate business, and these standards should be made the basis of municipal regulations. Meat inspection calls for frequent visitation of abattoirs, packing plants, commission houses, and retail stores, and the sanitary supervision of their methods and equipment, as well as the examination of food itself. The evidences of contamination are commonly such as not to require extensive

laboratory examinations of meat and meat products, although the laboratory is, at times, a necessity in order to determine the type of contamination, whether bacterial or otherwise. As in milk establishments, score cards should be used which are especially adapted to the type of industry under inspection. Standard score cards for slaughter houses, packing plants, cold storage plants, and other places where meat is handled have been prepared by the Federal Bureau of Animal Industry, and these, with slight modification, are readily adapted to local use.

The Inspection of Cattle at Slaughter

Since much of the evidence of disease in cattle, and particularly evidence of tuberculosis, can, in many instances, be readily removed by unscrupulous butchers, inspection of the carcasses of cattle at the time of slaughter is essential to good meat inspection. Without inspection at slaughter, inspection of meat in wholesale or retail stores is of relatively little value. The fact that cattle slaughtered for sale in interstate commerce comprise the bulk of meat used in most cities, and that such meat is under rigid inspection by veterinarians of the United States Bureau of Animal Industry, makes it necessary for local health departments to supervise only the slaughtering of such cattle within the state as are destined for local consumption. If the meat sold in the community comes from a place within the state, but outside of the local jurisdiction, inspection at slaughter is left, as a rule, to the authorities of the place where it is done, provided they maintain standards acceptable to the community where the meat is sold. In federal inspection of slaughtered animals, carcasses which are approved for sale are stamped in indelible ink as "inspected and passed" at several places on the carcass. The same procedure is usually followed in the inspection of carcasses by local meat inspection forces at abattoirs under their supervision.

In many communities, the inspection of cattle slaughtered on nearby farms and brought to the city for sale presents a difficult problem. It is practically impossible for the health authority to keep informed of where and when animals are slaughtered on the farm. As animals so slaughtered are even more likely to be diseased than those which come to slaughter at the abattoirs, the necessity of providing for their inspection is apparent. The farmer who sends cattle to an abattoir under official inspection knows that if the animals are diseased they will not be accepted, and he will

have to stand the loss. On the other hand, the farmer who slaughters his own animals, without official inspection, may escape such loss through selling direct to the retailer or consumer. In order to check the disposal of diseased cattle in this way, some cities have set up meat inspection stations to which the carcasses of all "country killed" animals must be brought for inspection prior to sale. As the evidence of disease may often be concealed by removal of the diseased parts or organs, it is the rule to require that the farmer bring the carcass to the inspection station with all essential organs *in situ*. If meat is found good for food purposes, the inspector stamps it as "inspected and passed" in the usual way.

In checking the completeness of inspection at slaughter, inspectors of local markets should be required to see that all meat held or exposed for sale shall bear the stamp of inspection, either of the federal, local, or other inspection service of approved standard. Severe penalties should be provided for those selling meat not bearing such stamp.

Inspection of animals at slaughter is of two types, namely, ante-mortem and post-mortem, inspection. Ante-mortem inspection consists in the physical examination of the live animals in order to detect those which are obviously diseased, or in such condition that they would probably be condemned when slaughtered. Such animals are separated from the rest and slaughtered in a special place provided for the purpose. This is the practice, at least, in abattoirs under federal inspection. Ante-mortem inspection is, however, frequently omitted in municipal inspection. Post-mortem inspection consists in a thorough examination of the carcass of the animal in all its parts, immediately after it is killed. Evidence of disease is particularly looked for, and tuberculosis is the disease most commonly found. If the disease is localized, and the meat otherwise wholesome, the diseased parts are removed and the remainder stamped as approved for sale. If the disease is general, or the carcass cannot be made salable for other reasons, it is condemned and utilized for other than food purposes. It is particularly important that the utmost care be taken in the handling of diseased carcasses, and that strict regulations be enforced governing the sanitation of the abattoir, and the disposal of condemned meat.

As a general thing, inspection at abattoirs should be done only by veterinarians. It is perhaps more important to have veterinarian inspection at slaughter of cattle than at slaughter of other animals,

because of the necessity of scientific diagnosis of tuberculosis of cattle. The employment of veterinarians, exclusively for inspection at abattoirs, might be extremely costly in many cities, and it might be found satisfactory to employ lay inspectors, provided they were well trained and under daily supervision by a veterinarian. The lay inspector should not, however, in any case, be permitted to pass finally upon the carcasses of tuberculous cattle. Professional judgment is required in such cases to determine whether the condition is one warranting condemnation of the entire carcass, or of only part of it. Where lay inspectors are employed, the rule is to require that all infected carcasses found by such inspectors shall be held for final examination by the veterinarian.

Practical Problems in Abattoir Inspection

The best practice in abattoir inspection is to require the centering of slaughtering at the fewest possible points, either through the coöperation of slaughter house proprietors, or through the establishment of a municipal abattoir. Where slaughtering can be so centralized, the cost of inspection can be considerably reduced through decrease of inspection force. Coöperative abattoir operation or municipal operation permits also the adoption of improved equipment and methods, which save the time of inspectors, and, at the same time, make their work more efficient. The average small abattoir proprietor is usually unable to maintain high standards of service, and still compete for business with the larger plants. Because his business is small, it is impossible also for him to make a financial success of the business of marketing by-products such as fats and oils, hides, fertilizer, etc. The result is that the business of slaughtering is more and more being taken over by larger plants which can keep slaughtering fees low because of their improved equipment and larger market for by-products. It would appear that, in most cities, the problem of inspection at slaughter will be, in part, solved through the centralization of the business in a few well equipped plants, either under efficient private operation, or municipal operation. A few small cities have established municipal abattoirs, and where they have been efficiently managed, the cost to the city for inspection, the cost to the cattle dealer for slaughtering, and the cost of meat to the consumer has usually been reduced.

The following description of the meat inspection service of

Columbus, Ohio, in 1916, though perhaps not a correct representation of the present situation in that city, illustrates the difficulty of carrying on the work satisfactorily and economically, where there are a large number of small abattoirs within the inspection area:

There are at present two large abattoirs, in each of which one veterinarian is stationed throughout the entire day. In thirty smaller slaughter houses, which kill three times weekly at scheduled hours fixed by the chief food inspector, inspection is performed by veterinarian and lay meat inspectors, who visit during these hours, the schedules being arranged so as to rotate the inspectors through all slaughter houses. In addition, there are twenty-nine slaughter houses in which slaughtering is occasionally done, and these are visited only on call. The total meat inspection force consists of four veterinarians and five laymen. In order that no meat shall be sold which has not been inspected, either by the inspectors of the federal government, or of the local health department, inspection booths are provided in the various market houses for the inspection of such meat as may have been uninspected at the time of slaughtering.

Forty of the slaughter houses are located within the inspection area of one mile beyond the city limits. The remaining twenty-one are located outside of this inspection area, and for inspections of those slaughter houses, a fee of sixty cents an hour is charged for the inspector's time, this time being calculated from the time of leaving the health department office to the time of return.

On the fifteenth of each month, a sanitary inspection is made of all slaughter houses, and the inspector files a report with the chief inspector, of conditions found and recommendations for improvement. Conditions needing correction are immediately taken up by the chief food inspector, and the inspector is charged with seeing that the corrections are made.

The chief inspector makes out a schedule of assignments of his staff monthly. Each two months this schedule is changed so as to give all men work inside large abattoirs, and in the routine inspection of small slaughter houses. Two of the inspectors who own automobiles, and who are given a monthly allowance therefor are, however, never assigned to large abattoirs, but are kept on the inspection of smaller places so that their automobiles may be used to best advantage.

It is not believed that under the present necessity of inspecting a large number of abattoirs any better plan could be devised than that which is now in effect. There is but one other plan which would result in greater economy, and probably improved supervision, and that is the erection and operation by the city of a municipal abattoir at which all slaughtering may be done, fees being charged by the

city for the service rendered. This has already been suggested at various times by the chief food inspector. It is recommended that this matter be given earnest consideration by council as a next step in conservation of city funds and in improvement of health service.

In an article in the *American City* for July, 1914, entitled, "Municipal Meat Inspection and Municipal Slaughter Houses," Dr. Ray Van Orman says: "It is almost impossible to secure an effective system of local meat inspection without a great increase in the number of competent meat inspectors employed, or a concentration of the business of slaughtering. . . . Instead of increasing the cost, the tendency of centralization is to reduce it. . . . One immense advantage to be derived from the consolidation of slaughter houses would be the increased value received from the by-products which are practically lost by the small slaughterer. . . . Fat cattle, for instance, dress only about 60 per cent of the live weight, sheep 50 per cent, and hogs 80 per cent. The remainder need not be destroyed and become a total loss, if there are proper facilities for handling it. This is done in modern abattoirs, but cannot be accomplished when there is not suitable equipment. . . ." Dr. Van Orman estimates that the by-products of slaughtering amount to fully 14 per cent of the live value.[7]

In most communities, one finds strong prejudice against municipal operation of food enterprises, such as the abattoir. Where there are large numbers of abattoirs requiring inspection, and municipal abattoir operation is impracticable for one reason or another, the coöperation of private dealers in central abattoir operation should be encouraged. If centralization of slaughtering can be accomplished through voluntary private effort, it is perhaps as well for the municipal government not to undertake the operation of a municipal abattoir. If neither of these plans for centralizing inspection fit local conditions, and the number of abattoirs requiring inspection is great, some such plan as that described in the foregoing excerpt is warranted. The hours of slaughtering, at the various abattoirs, should be so scheduled as to permit reduction of numbers of inspectors, and the burden of inspection should, in part at least, be shifted to the abattoir operators.

Inspection of animals at slaughter is designed primarily to protect the public health, but it has the effect also of preventing economic loss to the abattoir proprietor or packer through the pur-

[7] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Columbus, Ohio*, 1916 (printed), p. 55.

chase of animals whose carcasses might later be found unfit for food purposes. Under inspection, however, the purchaser of the animal pays only for such carcasses, or parts of carcasses, as are approved for sale, and the seller must stand the loss of condemnation. It is, therefore, entirely fair to ask the abattoir operator to pay part of the inspection cost, at least. In many cities, a head fee is required for each animal inspected, the amount of the fee depending upon the nature of inspection required, and the cost of the service to the city.

If the principal of putting part, or all, of the burden of inspection upon the establishments inspected is not accepted, the health authority must then determine to what extent inspection, at municipal expense, can be justified by the health protection which it guarantees. Important though meat inspection is, it is by no means as important as it has been made to appear in many communities. If adequate funds were not available for other measures for the prevention of disease, such as have already been described, it would be decidedly uneconomic to spend relatively large sums of money on inspection at abattoirs. If adequate inspection at abattoirs is not provided, then there is little use inspecting meat elsewhere, except as to methods of its care and handling. It would be fair to say that few health departments are justified in spending, without reimbursement, more than 5 per cent of their budgets on meat inspection, except under extraordinary or emergency conditions.

Sanitation of Abattoirs and Meat Stores

Through physical inspection of carcasses at slaughter is not competent to safeguard the public absolutely against meat infections, for many infections occur in meat which cannot be detected except by bacteriological examinations. Many such infections doubtless exist in animals before slaughter, but a great many occur after slaughtering from the hands of workers, from dirty utensils, fixtures, dust, dirt, flies, etc. Although meat is perhaps not as readily contaminated as milk by contacts of this kind, and the dangers to consumers not as great, the same principal of sanitation as apply in milk handling should apply in meat handling. Meat handlers should be clean and free from disease; their tools, utensils, and equipment should be kept clean; meat should not be exposed to dust, flies, or other contamination by animals or insects; provision should be made for proper cooling of meats, and proper

facilities should be available for the maintenance of the cleanliness of premises, equipment, and persons employed.

The regulations governing meat handling should cover all of these points in detail; and in inspection, score cards should be used which call for precise information on these points. In most retail stores and commission houses, there is no great difficulty in enforcing proper standards of cleanliness. There is considerable difficulty, however, in enforcing such standards at abattoirs. The abattoir is a dirty place, at best, when slaughtering is being done. Employees at slaughter houses become so accustomed to the inevitable conditions of uncleanliness that they are quite apt to become careless in their personal conduct, and in the care of equipment.

The first requirement of an abattoir, is that it be so constructed that it can be cleaned, that is, the floors should be of concrete, or other washable material, and properly drained. Preferably, the walls also should be surfaced with a washable substance, or should be frequently whitewashed. There should be an ample supply of hot water always available and, at the conclusion of the day's work, the entire place should be thoroughly washed with hot water. The building should be rat proofed, because the rat is a dangerous disease carrier, and feeds upon the entrails of animals, which are the parts most often diseased. Flies, and other insects, should be screened out. All refuse and wastes should be promptly disposed of so as not to create a nuisance to sight or smell, and should be kept sealed against rats, flies, and other vermin at all times. Proper toilets and lavatories should be available for the use of workers.

Fortunately, the larger abattoirs are usually conducted with due regard for sanitation. Operators of such abattoirs have found that cleanliness is a paying proposition, and that carelessness in food handling cuts down business profits. It is in the small abattoirs, doing a local business, that one commonly finds conditions at their worst. The following picture of one such abattoir is typical of what may be still found in many American communities:

The health ordinances of the city prohibit the sale or offering for sale of any "unwholesome, stale, diseased, emaciated, stuffed, tainted, putrid, or measly meat, poultry, or any animal or carcass or part of the carcass of any animal" within the city of Jamestown. There is, however, no present means of enforcing this ordinance. The sanitary inspector of the health department, who is also the dairy and milk

inspector, is unable, because of his numerous other duties, and because he is a layman without technical training, to make such inspection of meat as will prevent the sale or offering for sale of meat answering the description of the ordinance. . . .

In this connection, it should be noted that a slaughter house which is conducted without the slightest regard for sanitation is now in operation within the city and within a stone's throw of the center of the city. It is an old, ramshackle, wooden building on the bank of the Chadakoin River, and although the sanitary inspector says that no official complaints have been made against it, the tuberculosis nurse states that she has heard frequent complaints about conditions there. The slaughter house is owned and operated by a retail meat dealer of the city, who owns several small stores. When visited by the investigator in company with the sanitary inspector, this slaughter house was found in a very insanitary condition. On the lower floor a man was making sausage. The floor was slimy and wet with filthy water and sausage material. The walls, ceilings, tables, and utensils were dirty, and the sausage maker himself was dirty. On the upper floor, which is the killing floor, two men were killing and plucking chickens which lay upon the floor and were swarming with flies. The same conditions of sliminess and filth were everywhere evident, and there were ample indications that the building was rat infested. One of the employees stated that killing was only about once a week and only a small number of cattle were slaughtered and dressed. But under such conditions of uncleanliness of the premises, there is warrant for believing that not much care is given in insuring that the cattle slaughtered are fit for food purposes.[8]

No such establishment as that above described should be tolerated in any community. If licensing of slaughterhouses is required, and licenses issued only to those maintaining proper standards of construction and operation, refusal of license would automatically put the bad ones out of business, at least within the area of municipal jurisdiction. It would be unreasonable, however, for a city to prohibit the sale of uninspected meat from such an abattoir within the city, unless it provided for inspection, but it would be quite proper for the city to furnish inspection and assess part of the cost of inspection against the operator of the plant.

In the sanitary inspection of retail stores and commission houses, provided there has been proper prior inspection of animals

[8] New York Bureau of Municipal Research, *A General Administrative Survey of the City of Jamestown, New York,* 1916 (printed), pp. 183, 185-186.

at slaughter either by federal or local inspection services, insistence upon cleanliness of meat handlers and their equipment is the chief aim. The amount of such inspection required will depend, largely, upon the patronage of the establishments. The meat dealer who caters to what is called the "high class" trade will not require as much inspection as the dealer who serves a poorer class of people. The latter must sell his meat cheaper, and he is, therefore, likely to sell a poorer quality of meat. His patrons are likely to be less insistent upon cleanliness of methods and equipment, and perhaps less competent to make fine distinctions between cleanliness and dirtiness. The dealer with the "high class" trade knows that cleanliness is an asset, and that his customers are more particular, both as to the quality of meat and the sanitary facilities of his establishment. It is, therefore, largely a waste of inspectors' time to have them going about on routine inspections of meat stores of all classes, when the serious health dangers are chiefly to be found in a few. By scoring all meat establishments, those requiring most frequent inspection may be identified and inspection centered upon them.

C. Inspection of Foods Other Than Milk and Meat

The sanitary inspection of food establishments, such as vegetable and fruit markets, grocery stores, delicatessen stores, bakeries, confectionery stores, restaurants, etc., is not of great health importance except to the extent that such establishments may have a share in milk distribution. In food stores and restaurants generally, the health dangers are not ordinarily due to the foods themselves but rather to their exposure to disease contamination by human disease carriers, insect disease carriers, dust, and other filth. Obviously, there is little danger to health from packaged goods which are protected from contamination by their coverings, nor from other foods which are cooked before being eaten. Vegetables, fruits, etc., which are washed, peeled, or otherwise freed from surface dirt before eating are likewise not a great source of danger. Vegetables eaten uncooked, such as lettuce, celery, water cress, etc., which are not infrequently grown in polluted soil, may be a source of infection if they are not thoroughly washed, but none but the careless housewife would neglect such precaution. The chief disease danger in this country to be anticipated from the eating unwashed vegetables is typhoid fever. Several epidemics of typhoid fever from eating water cress grown in polluted soil have been

reported, and celery has also been suspected as the medium of typhoid infection in certain epidemics. Presumably, also, other intestinal infections may be caused in the same way.

Although the possibilities of disease transmission by means of foods other than meat and milk are to be recognized, it can safely be said that routine food inspection in markets or restaurants is hardly competent to prevent such infections. About all that such inspection can do is to correct the more obvious conditions which would tend to food contamination through bad care of food or uncleanliness of methods and equipment. Food inspection for the detection of adulteration is another matter and one to which health inspectors should, of course, give attention, if there is direct evidence of it. But as a general thing, the health inspector should center his effort upon the correction of obvious defects in food sanitation. The following citation from a report on the sanitation of a public market in a large city illustrates our point:

The first market was visited in the afternoon after market hours when, as the clerk said, it had been "cleaned up" for the day. On this visit the investigator was accompanied by the chief sanitary inspector of the health department in order that there might be no difference of statement or opinion as to the conditions found. The market was generally in filthy condition. In the meat market in which there are fifty-four stalls, every stall was inspected and not a single one found which would pass inspection. All were indescribably dirty. The porcelain-topped counters were dirty and decaying filth was found in crevices of the top; utensils such as meat grinders, knives, saws, etc., were also unclean, and in some instances had not been washed at all. Meat blocks were not scraped clean and scrubbed, and in crevices of the wood fly pupæ were found. Clothing used by the stall holders was in some cases thrown in a heap on the floor and in a disgustingly dirty state. On the floors behind the counters were found scraps of meat, bones, boxes, bags, barrels, and refuse of every description, unprotected in many instances from the flies with which the market swarmed. In several instances evidences of rats were noted, and in one stall two large rats were seen.

The responsibility for this wretched use of an excellent market building lies partly upon the administrative board, partly upon the clerk of the market, and partly upon the food inspector of the health department, who visits the market several times each week. But no matter who is responsible, conditions should be corrected immediately and the terms of the lease enforced. As previously noted, the lessee binds himself:

1. To keep clean, by washing and sweeping, the stall windows and floors of the interior of the stall.
2. To wear a coat of some white material, the said coat to be kept clean and sanitary.

The lease further states that failure as to any of these conditions shall act as an immediate revocation of the license and yet there was not a single stall holder in the meat market who would not have had his license revoked had these rules been enforced.

In the vegetable and fish market, conditions were somewhat better because of the fact that the majority of articles sold in this market can be handled in a more cleanly manner, but even here the insanitary methods of handling food products and the disposal of refuse therefrom need immediate attention.

The refuse from the market is simply dumped into the middle of the street at one end of the market. It is not protected from flies in any way and naturally flies swarm upon the refuse pile and about the market. Within thirty feet of this refuse pile are two quick lunch restaurants, and across the street, about fifty feet away, is a bakery. The contact of flies with food is thus readily made, and since the rôle of the fly as a carrier of disease is established, it is not too much to conclude that this refuse pile is a distinct menace to health, since the refuse is removed by the street cleaning department infrequently.

A refuse storage room was built at the end of the market where the refuse pile is now located, but the clerk of the market states that owing to the difficulty of loading the refuse from this room, the room was not used. A refuse box was also devised but this also proved unsatisfactory. The most satisfactory way of handling this refuse would be to place it directly into a wagon which could be properly covered and drawn away when necessary, another wagon being left in its place. This would require an extra wagon, of course. Another alternative would be to have a sufficient number of garbage cans which could be kept covered. The disposal of refuse at this market is by no means a difficult problem and some such plan as has been suggested should be immediately adopted.

The connection between filth, flies, food, and disease has already been suggested in the description of the method of handling refuse. There is, however, a still more serious menace in the toilets of the markets. At one end of the market is a toilet for colored persons used by the public and the stall occupants. This the clerk of the market keeps locked because, as he said, it is abused when left unlocked. This toilet contains two bowls, one urinal, and two wash bowls. The bowls must be flushed by the user and because of the neglect of the users to do so, the bowls are frequently left filled with

excreta. As there is nothing but a wide mesh screen through which flies find ready ingress and egress,—thus again the contact of flies with filth and food is established. No toilet paper was supplied in this toilet room, except old pieces of newspaper, the use of which made it well nigh impossible to flush the bowls properly. Although there are two wash-basins in the room supplied with running cold water, no hot water being supplied, the handles of the faucets were broken off, so that it was practically impossible to use them. There was no soap, or anything upon which the user might dry his hands provided he did manage to wash them. There is naturally then, no inducement for users of the toilet to wash their hands, and as many of those who use it go back to the market to handle foods, a distinct danger to citizens results. The proper disposal of excreta and proper cleanliness of food handlers is impossible under conditions existing in this market.

The toilet for whites at the other end of the building was found in somewhat better condition. The toilet has practically the same equipment as the one for colored people, but like the other, it is not supplied with toilet paper, or soap and towels for cleansing the hands. This toilet had, however, the advantage of having automatic flush closets so that the flushing of the closet is not dependent upon the carelessness of the individual.

These toilets should of course be put into proper condition for use immediately. They should be properly screened; toilet paper, soap and paper towels should be supplied; water faucets should be put in condition for use, and automatic flush closets should be installed in the colored toilet. It should then be made the duty of the clerk of the market to see that these toilets are kept clean and in proper condition. If they were visited frequently by this officer, he could prevent any serious abuse of equipment. Signs posted in the toilets warning users about the dangers to themselves and others from improper use of toilets or improper cleansing of their hands would perhaps help. People can be educated in a few principles of common decency if an effort is made to do so.[9]

Methods of Inspection of Food Establishments

Inspection of food stores generally should not be based upon a hit or miss system of routine inspection, but rather upon a properly organized plan for centering inspection where it is most needed. Some food establishments of the better class will need little inspection; others of a lower class may need a great deal. Certain food stores, such as groceries, will need little inspection unless they

[9] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Richmond, Virginia,* 1917 (printed), pp. 603-605.

handle milk; other food establishments, such as bakeries, restaurants and lunch counters catering to a certain class of patrons, may need more attention. A plan of inspection which has been found effective in many cities is first to make a preliminary inspection, scoring and classifying all food establishments on the basis of the type of business carried on and their rating as evidenced by their scores. When such classification has been made, the chief of the food inspection service may determine what food businesses and what establishments are most in need of attention, and may direct his force accordingly. Certificates of grade should be issued to all food establishments according to their rating, and these certificates should be conspicuously posted on the premises. For example, those places scoring 90 to 100 may be designated as of A grade; those scoring 80 to 90, as B grade; those scoring 70 to 80, as C grade, etc. If it is found on review of scoring records that the chief dangers to health are to be found in bakeries or restaurants, these establishments should receive first consideration, and inspection should be directed at the outset to those having the lowest ratings. The proprietors of places having low ratings, which are publicly evidenced by certificates of grade, will naturally want to obtain better ratings, and their coöperation in the correction of defects of sanitation is likely to be more prompt. As stores of low grades are improved and attain higher grades, the amount of inspection necessary can therefore be considerably reduced and effort constantly directed to the places and conditions most dangerous to health.

In most cities food inspectors are assigned on a district basis and their inspectional work consists in the investigation of food complaints and a routine place to place inspection along a more or less fixed route. This type of food inspection wastes a great deal of the inspector's time for many of the places which he inspects are of such character that the possibility of health dangers in food handling is slight. It is better to assign the food inspection force to definite inspectional projects as may be required. The inspector who is assigned to a district for day in and day out routine inspection is likely to become so accustomed to a fixed route and to the same contacts that he loses his sense of values. Furthermore, the inspector may become so well acquainted with the proprietors of the food establishments in his territory that his effectiveness in correcting conditions is considerably lessened. If the district plan of inspection is followed, inspectors should be frequently shifted

from one district to another to avoid too great familiarity with the proprietors of such establishments.

There is no field of municipal service in which the opportunity for bribery and corruption is greater than in food inspection, and constant pressure is continually being brought upon inspectors by unscrupulous food merchants to permit evasion of the law. To insure the integrity of a food inspection force requires, first of all, intelligent direction of their work, and second, the requirement from them of complete records of where, when, and what they did. It goes without saying that the method of selecting food inspectors should be such as give proper weight to the employee's honesty and ability, and that salaries should be paid them which will eliminate as far as possible their temptations to make something "on the side." The salaries of lay food inspectors are generally lower than they ought to be. They are commonly paid from $1,500 to $1,800, and this salary for the type of man required is decidedly too low to encourage good men to enter public service.

The Health of Food Handlers

No matter how efficient the lay food inspector may be in detecting and correcting dangerous conditions and practices in the establishments which he visits, he cannot wholly protect the consumer against the personal uncleanliness or disease of the food handler himself. If the food handler has a communicable disease, such as tuberculosis, syphilis, typhoid fever, diphtheria, or other disease readily transmitted to others in food, there is obviously serious danger to the consumer for which mere inspection of premises provides no safeguard. The danger to the consumer is greatest when persons having communicable disease handle foods which are not cooked or cleansed after handling and before eating, and which like milk, are good media for the growth of infective organisms. Milk is so easily contaminated in this way that the freedom of milk handlers from communicable disease should be insisted upon at all times. In restaurants and lunch rooms particularly, the employment of persons having communicable diseases should be carefully guarded against, since the hands of cooks and waiters may readily contaminate the food just before it reaches the consumer. The dishes in which food is served and the glasses from which the consumer drinks are also readily contaminated by the hands of the waiters or dish washers, or from the water in which they are washed. The restaurant employee with com-

municable disease, even if he is more than ordinarily careful, cannot avoid endangering the health of restaurant patrons. It is difficult to demonstrate fully the extent to which communicable disease carriers among food handlers contribute to the spread of disease, but it seems highly probable that their contribution is much greater than is commonly supposed.

In 1917 a study was made of the health of 1,980 food handlers at the occupational disease clinic of the New York health department. The persons examined included waiters and waitresses, male and female cooks, bakers and a miscellaneous group, chiefly dish washers and other kitchen employees. The examinations, which were intended primarily to detect the presence of communicable diseases among food handlers in conformity with a special provision of the sanitary code of New York City, revealed 10 active cases of tuberculosis, and 15 cases of arrested or suspected tuberculosis, 19 active and 32 suspected cases of syphilis, and 6 cases of active gonorrhea. Of the 41 cases of active and suspected syphilis, 30 were among the 695 waiters. In other words, one waiter out of every 23 was an active or suspected case of syphilis, and one in every 63 had the disease in open, active form.[10]

In Pasadena, California, in 1920, in conformity with an ordinance requiring physical examination of food handlers in certain employments, 1,041 persons were examined by physicians of the health department and private practitioners. Among this number, 15 active cases of tuberculosis were found and 10 cases of suspected tuberculosis. Sixty-two food handlers gave the positive blood test for syphilis. Two of the syphilitic persons were soda dispensers who had active sores on the body and in the mouth, and one baker who mixed his dough by hand had pustular syphilitic sores on his body. One hundred and four persons gave a history of typhoid fever but the health officer's report does not state whether or not any of these persons were carriers. Presumably they were not, but the fact that 104 had a typhoid history is in itself sufficient evidence of the potential menace of typhoid carriers in food handling.[11]

[10] Louis I. Harris and Louis I. Dublin, *The Health of Food Handlers*, Monograph Series No. 17, Department of Health of the City of New York, 1917.

[11] J. S. Hibben, "Preliminary Report on the Physical Examination of Food Handlers in Pasadena, California," *Monthly Bulletin*, California State Board of Health, December, 1920.

Although physical examination of food handlers was not a new thing at the time of the studies above described, there were only a few cities where any well organized effort was being made to exclude persons having communicable disease from food handling. To-day most of the largest cities and many of the smaller ones prohibit the employment in certain food businesses of any person who has not received a certificate of health approved by the local health authority. In some small cities these examinations of food handlers can readily be made by official health physicians. In some larger cities, such as New York, the many examinations required have forced the health authority to accept the examinations of qualified private physicians in lieu of examination by an officer of the health department. When the examinations are made by private physicians, however, the rule is that the formal health certificate shall be issued only by the health authority. Wherever it is possible to do so, food handlers should, however, be examined only by officers of the health department. The most satisfactory plan is for the health department to provide a special clinic for the purpose.

If physical examination and health certification of all food handlers cannot be provided, effort should be centered on the control of food handlers in places selling milk, in restaurants, lunch counters, bakeries, and other places, where the danger of disease infection is greatest. If general food inspection as a measure of disease prevention is to be worth even a part of what it costs, it is obvious that emphasis must be put upon protection against the disease dangers known to exist in the persons of food handlers rather than upon remote health dangers possibly inherent in food itself. Ample authority is afforded local communities in most states to prohibit food handling by persons having communicable disease, but comparatively few health officers have taken advantage of their opportunities in this respect. Even where the state law makes positive provision for protection of the community in this way, it is not uncommon to find the law badly enforced. A typical illustration is cited:

> The state law requires that hotels, restaurants, and eating places shall not employ cooks, waiters, chambermaids, kitchen help, or other house servants suffering with certain communicable diseases, and that persons found to be suffering with such diseases shall be excluded from employment. All such employees are supposed to receive medical

examination and to be provided with a health certificate by the local health authority. . . .

The records show that a large number of employees in these places give a history of typhoid fever but there is no evidence to show that an examination was made to determine whether or not such persons are still capable of transmitting the disease, *i.e.*, are "typhoid carriers." That this condition was anticipated in the law is evidenced by section 31 of the law which states that:

> "No person or persons, firm or corporation operating or conducting any hotel, restaurant, dining car, or other public eating place in this commonwealth, shall keep in their employ in any of the several capacities mentioned . . . any person who is a carrier of typhoid fever."

Obviously, this provision of the law can have no effect unless some examination is made to determine whether or not persons who have had typhoid fever are actually carriers. To determine this fact, a laboratory test should be made of the excreta and urine of the individual. If typhoid bacilli are found in the bowel or urinary discharges of the employee, he is a carrier and should be dealt with accordingly. Here again is indication of the need for municipal laboratory service. It is possible that much of the typhoid fever found each year in the Bethlehems can be traced to such carriers. . . .

Further evidence of the defect in the enforcement of this law is available in the records. In 1916, a large number of employees in restaurants and eating houses failed to secure the necessary health certificate. A physician member of council examined forty-five of these employees but the employees never came to receive their certificates of health which are still in the office of the secretary of the health board. Presumably, the persons examined are still employed and the law is being violated daily.[12]

The Organization of a Bureau of Food Inspection

As indicated in the foregoing discussion of food sanitation, three types of inspection are recognized, namely, milk inspection, meat inspection, and inspection of foods other than meat and milk. Since all three types of service are closely related in purpose, a bureau of food inspection should provide for all under central direction. The most important activities are milk inspection and inspection of slaughtering, and it is therefore desirable that the director of the food inspection bureau be a veterinarian.

[12] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Bethlehem, Pennsylvania*, 1917 (typewritten), pp. 146-148.

The extent to which the activities of the bureau should be developed in the special inspection fields above named will depend naturally upon local circumstances, and also upon what needs to be done in other and more important fields of health service. Given a small appropriation for health work, it would not be good policy to spend large sums on food inspection other than milk inspection to the disadvantage of activities more productive in community health, such as control of communicable diseases and child hygiene. The protection of the milk supply is a major phase, both of communicable disease control and child health protection, and lacking sufficient funds for general food inspection work, it is better to put the emphasis on milk inspection rather than on other food protective measures. If there is a proper milk ordinance which provides for pasteurization of the major part of the milk supply, and an efficient laboratory service, the number of milk inspectors required will be less than where such conditions do not obtain.

In the larger cities it may be desirable to maintain within the bureau of food inspection, a division of milk inspection, a division of meat inspection, and a division of other food inspection, each under a competent chief. In the smaller cities, this divisional organization will probably not be necessary. Two kinds of inspectors are commonly needed, namely, veterinarians and laymen. Veterinarians should be employed mainly on dairy inspection and abattoir inspection. Lay inspectors are useful chiefly in routine inspection of food stores, the investigation of citizen complaints, and the collection of food samples for laboratory test. Economy in food inspection depends largely upon the elimination of duplication of inspection. Since many stores handle milk, meat, and other foods, too great specialization in food inspection work is likely to lead to such duplication. For the average small city it is probably better to provide the veterinarians and lay inspectors necessary and to assign them according to general food inspection needs rather than according to any fixed plan of differentiating them as milk inspectors, meat inspectors, and what not. In the large cities, it may of course be highly desirable to make such differentiation of inspectional activities because of the greater complexity of problems of food production and distribution.

Whatever the type of organization, it is well to give both veterinarians and lay inspectors opportunity to broaden their experience by assigning them, as far as practicable to food inspectional work along all lines. The city milk inspector who is occasionally given

an assignment to inspect dairy conditions in the country, will be a more valuable inspector of conditions in city milk stores. The meat inspector assigned to retail meat stores and markets will be better equipped for such work if he has some experience in inspection of animals at slaughter. The veterinarian inspector of slaughtering or of country dairies will profit similarly by occasional assignments in other fields. It is often desirable and sometimes necessary that veterinarian inspectors be given fixed assignments to abattoirs and to country dairy inspection, but it is certainly not desirable to have these duties so defined by bureau organization that the head of the bureau is handicapped in the disposal of his inspection force.

In many cities, inspectors are selected and appointed under civil service, or otherwise, as milk inspectors or meat inspectors, and in some instances their designation as inspectors in these special fields makes it difficult for the health officer or director of the food inspection service to utilize them in food work other than that for which they were specifically designated. It is better not to provide any such distinctions with respect to the qualifications of food inspectors. They should be appointed as food inspectors, veterinarians or lay inspectors, and their assignment left to their superior officer.

It is impossible to offer precise estimates of the number of veterinarians or lay inspectors required for any city of given size. There is no ratio between numbers of inspectors and numbers of people which is of general application, because of the wide variations in the numbers of food establishments of different types, the area of the inspection field, the nature of inspection required under state and local laws, and the many differences in cities with respect to food production and distribution. Experience indicates that in the average city where food inspection work is limited chiefly to inspection for disease prevention rather than for the prevention of food adulterations of all kinds, and where field inspection is properly directed and supported by efficient food laboratory service, one good city food inspector ought to be able to do the inspection work required for a population unit of 25,000. The number of abattoir inspectors and country dairy inspectors must be determined by careful survey of these special inspection fields.

Since good direction of food inspection work depends in large measure upon detailed reports of inspectors' activities, provision should be made in the bureau of sufficient clerical force to handle

these records and to carry on the routine office work of the bureau. The director of a food inspection bureau should not be merely an office worker; his greatest field of usefulness is in the field, supervising the work of his force and making special studies of food sanitation problems in their broader aspects.

CHAPTER XII

SANITARY INSPECTION

The term sanitary inspection, as used to describe one of the major functional groups of health activities, comprehends a great variety of regulatory work which devolves upon municipal health departments largely because of traditional popular views on the causation of disease. In spite of the fact that modern sanitary science has demonstrated that *persons* and not *things* are mainly responsible for the transmission of disease, the public is quite generally convinced that anything offensive to sight or smell is necessarily harmful to health. So it is that municipal health departments are called upon to enforce ordinances for the prevention and control of offensive things of great variety. Some of this regulatory work is clearly productive in the prevention of disease; a great deal of it is the relatively unproductive work of preventing nuisances and annoyances which have only a remote bearing on disease prevention.

Such matters as the supervision of plumbing installations, the supervision of garbage and waste disposal, the inspection and correction of street nuisances, defective drains and obstructed catch basins, leaky roofs, weeds in vacant lots, the keeping of domestic animals, and a great variety of other regulatory activities, put a heavy financial burden on health departments and produce relatively little health return. In times of disease epidemics, the public is particularly prone to view with suspicion almost every accompanying circumstance or condition of environment. The odors emanating from freshly excavated earth and open drains, melting snow piles, accumulation of garbage and other refuse, the so-called miasmal vapors from swampy ground, and many other like conditions have been credited at times with responsibility for disease epidemics, although it is only occasionally that they have anything whatever to do with the matter.

It is true that nuisances of the type described may under certain

circumstances contribute to the spread of disease, not because they are of themselves productive of disease, or "breed disease," but because they are frequently associated with disease-disseminating agents. For example, there is nothing inherently dangerous to health in a manure pile, but manure piles may be favorable places for flies to develop and the fly is a very active disease carrier. A swamp may not in itself be dangerous to health but if it is a place for the breeding of disease carrying mosquitoes it may become a serious health menace. An evil smelling garbage pile may not endanger health in the least, but if it is a breeding place for flies, or a food storehouse for rats, it may contribute greatly to the spread of disease. The same is true of evil smelling privy contents and other accumulations of filth which may become dangerous because they are exposed to flies and rats, or because they may cause dangerous soil pollution and thereby contaminate the persons, food, or drink of human beings.

The question which the health authority must solve is which of these many nuisances and annoyances are dangerous to health in view of the circumstances of their existence. It may be that the laws under which the health authority operates compels the carrying on of many nuisance regulatory activities which are clearly not productive in health benefit, however desirable they may be in other respects. It is, of course, the duty of that authority to enforce all laws given it to enforce, but a health officer would indeed be recreant to his duty to the public if he overemphasized regulatory activities of this character at the expense of other activities of known and proven health value.

Before considering in detail the nature of the special activities which are of major health importance in sanitary control, it may be well to dispose of two municipal service functions which are frequently but inadvisedly made responsibilities of municipal health departments. These are plumbing regulation and garbage disposal.

Plumbing Inspection as a Health Activity

The notion that plumbing inspection is an important phase of public health service is quite firmly rooted in the public mind. It is commonly believed that one of the great dangers in the disposal of human wastes is the escape of noisome gases or other bad smelling emanations from the disposal system. It is true that air heavily laden with sewer gas is dangerous, but except in closely confined spaces, and under conditions which would not obtain in

the average home or place of employment, the danger from sewer gas is a very remote one.

From the point of view of public health, the simplest system of disposal of human excreta, namely, frequent removal and burial in the earth, would satisfy all sanitary requirements, if it could be done in such a way that disease organisms would not be spread directly, or indirectly, from it. Such a system of disposal can be utilized with absolute safety in some rural areas, if it is done with care. In urban districts, a more elaborate water carriage system of disposal is, of course, necessary. The health authority is not primarily concerned with the plumbing system necessary for waste disposal as long as the infective material, human excreta, is deposited in a safe place, or carried safely to some other place where it is destroyed or otherwise treated to prevent its spreading infection. But the enforcement of plumbing regulations, which is so often made a responsibility of municipal health authorities, requires the maintenance of an inspection force to examine plans of plumbing installations, inspect the construction of the systems and the materials which go into them, and test their competency when completed. The enactment of elaborate codes of plumbing regulations has compelled municipal authorities to employ large numbers of plumbing inspectors, who must be plumbers, and to carry on a costly inspection service which has very little health value to the community. The person chiefly benefited by the routine inspection of plumbing installations is the one who pays for it. Inspection by the city authorities protects him from loss through bad workmanship or defective materials by compelling the plumber to conform to the standards set up in the plumbing code.

Plumbing inspection is primarily a part of building inspection and fits in well with the building inspection service necessary for public protection against bad building construction. In cities where there is a department or bureau of building inspection, plumbing inspection can be more economically and efficiently administered along with other building inspection work in such a department or bureau, and to-day's trend is decidedly in this direction. In many cities, however, where there is no such department or bureau of building inspection, it is often expedient to give the health department administrative responsibility for the service, but in such cases its comparatively low public health value should be recognized. It is extremely difficult to keep plumbing inspection costs low and in their proper proportion to other activities of the health

department. Plumbing inspectors must be plumbers and their salaries are commonly higher than for lay inspectors in essential health activities. Then, too, the enforcement of elaborate codes of plumbing regulations often call for a greater amount of inspectional work than in many other more important fields, and consequently more inspectors.

In any case, whether plumbing inspection is under health department or other control, the method of assessing the cost of plumbing inspection against the person primarily benefited should be followed out by requiring fees for the examination of plans and for plumbing permits. The fees should be based upon the nature of the installation and the amount of inspection required to meet the standards of the plumbing code. The installation of a plumbing system in a large office building, for example, would require a great deal more service in the examination of plans and in subsequent inspection than would an installation in a private dwelling, and fees should, therefore, be adjusted accordingly. The fees should be collected from the plumber making the installation who would naturally include such charge in his bill to the owner. As in the case of other permit of license fees, the amounts collected should revert to the general fund of the city.

The procedure of regulating plumbing work is briefly as follows: The plumber submits to the chief plumbing inspector of the city the plans of his proposed installation. These are examined by the chief plumbing inspector, or an assistant, to see that they conform to legal requirements. If they are accepted and approved, a plumbing permit is issued to the plumber who proceeds with his work. At least two inspections are usually given the work of installation during its progress. The first inspection is given when the piping is put in place, and the second when all connections are made and the system is ready for operation. Other inspections are made as required in special cases as the work progresses. Finally, before the system is put into use, a test is made to see that it functions properly and that there is no leakage anywhere.

Good regulation of plumbing requires that only licensed plumbers shall be permitted to engage in the plumbing business. Licenses are issued usually by a board of plumbing examiners which gives the applicant an examination including certain written, oral, and practical tests of their competency. The health officer, or other representative of the health department, is often a member of the examining board. The fees for examination and licensure are in

most instances kept by the board of examiners to pay their incidental expenses. It is not good practice, however, to permit these fees to be retained by the board of examiners. Where such an agency exists, its expenses should be provided for in the city budget just as other municipal agencies, and all fees collected by it should be turned over to the city treasurer.

Garbage Collection and Disposal and Its Health Significance

Garbage collection and disposal stands in the same relation to municipal health service as plumbing inspection. The failure of proper collection and disposal of garbage may result in the creation of conditions conducive to the spread of disease by flies or rats, but since there is nothing inherently dangerous to health in garbage accumulations, the administration of collection and disposal procedure is not properly a health function. There are to-day relatively few large cities where such work is under health department management, but in many smaller cities, where other departmental agencies for "municipal house cleaning" have not been adequately developed, health departments are frequently required to give a great deal of time and attention to these matters, often to the neglect of other and necessary work of the most vital health importance. It may be that the health department is quite competent to administer the collection and disposal of municipal wastes, and it may do its work well. The difficulty is, however, that by the inclusion of this work as a major health activity, the cost of health administration is made to appear large, when as a matter of fact, the really necessary health services represent only a very small part of the total expenditure. The public, considering the entire appropriation as money to be spent for community health, may believe the health service of the city to be adequately supported when it is in fact very poorly supported for efficient community protection. In Jamestown, New York, a city of about 30,000 population, where the health department was held responsible for garbage collection and disposal, this was exactly the situation in 1916, as disclosed by the writer's study. Quoting from his report:

> In the past fiscal year the health department spent $12,730.44 for garbage collection and disposal out of a total expenditure for all so-called health purposes of $28,257.91. The inclusion of this function at its heavy cost under health department control tends to create the

impression that the city is spending a considerable sum for health service, whereas as a matter of fact its actual expenditure for productive health work is very low. The transfer of this function from the health department to the department of public works would not of itself be an economy perhaps, but it would permit a fair estimate of the cost of health service to the community and would no doubt make clearer the need of the health department for increased appropriation for those health functions which are actually measurable in health returns.[1]

This is the crux of the whole situation with respect to the administration of such services by health departments. If through the inclusion in the health department of plumbing inspection, garbage disposal, street cleaning, and other related activities, it is made to appear from their relatively high cost that the health department is doing essential health work and is properly financed to do it, it is extremely difficult to make it clear to citizens why money is needed for the development of health services which are apparently of less importance but actually of greater importance. There are not a few small cities where efficient control of communicable diseases and child health work have been seriously handicapped by requiring the health department to spend a great deal of its time and energy on the administration of public service functions, which should properly fall to other administrative agencies.

It is clearly a responsibility of the health authority to see that garbage and refuse are so disposed of that no menace to health may be created, but that should be the limit of its responsibility. The health officer should advise those responsible for administration of the work in this respect, and should take action against both the citizen and the refuse disposal agency, if health regulations are violated. He should not, however, provide for the policing of garbage dumps, incinerating plants, or other disposal establishments which are under the administration of other city departments. If such departments are unable to secure compliance with the law on the part of householders or others, it may be necessary for the health authority on occasion to take advantage of its broad general powers to enforce the law for the correction of nuisances. Citizen complaints of garbage nuisance should be investigated by the health department, if the complaint indicates that an actual health danger exists. On the other hand, if the complaint is merely

[1] New York Bureau of Municipal Research, *An Administrative Survey of the City of Jamestown, New York,* 1916 (printed), pp. 191.

one that concerns the character of service rendered by the collection or disposal agency, and no health danger is apparent, the interference of the health authority is not ordinarily required.

Chief Problems in Sanitary Control

Leaving out of consideration, then, those activities such as plumbing inspection and garbage collection and disposal, which we have considered as properly responsibilities of other municipal departments, we may summarize the essential activities of sanitary inspection as follows:

1. The prevention and correction of insanitary conditions of house occupancy which may be responsible for promoting the spread of communicable disease or otherwise inducing sickness.

2. The prevention of dangerous soil pollution through improper disposal of human excreta.

3. The prevention of conditions which promote the breeding of flies, mosquitoes, and other disease carriers, and their direct or indirect contact with persons.

4. The prevention of the use of drinking water from contaminated sources.

5. Miscellaneous disease preventive activities, such as the prevention of the use of common towels and common drinking cups; the sanitary supervision of barber shops, public baths and swimming pools, and public comfort stations, the prevention of promiscuous spitting, and the prevention of health endangering smoke nuisance.

There are many other sanitary inspectional activities which might be included under this last general head of miscellaneous disease preventive activities. Most of them are, however, incidental to ordinary inspectional routine and to the investigation of citizen complants of great variety, and need no special consideration here

Sanitary Supervision of Housing

In perhaps a majority of cities, special bureaus or departments of building inspection, independent of the public health authority, have been created to supervise building construction. In such cities, health departments are charged only with the inspection of conditions of buildings or the circumstances of their use, which may be hazardous to the health of occupants or the general public. If there is a good building code, as there should be, governing the construction of buildings, and administered by a bureau of building

inspection which includes plumbing regulation, the health officer's duty with respect to housing sanitation will be considerably lessened. If there is no such building code and no agency to provide for building regulation, including plumbing, it may be desirable to have the health authority examine and approve the plans of dwellings and other buildings with respect to the character of their use and the equipment and facilities necessary to insure that in such use health dangers will be prevented or reduced as far as possible. Such plan examination by the health authority is, however, of little value unless provision is made in the health department for competent technical engineering advice on the matter, and unless some suitable standards of building construction and use have been officially set up. This amounts practically to the enactment of a building code and the establishment of a bureau of building regulation within the health department. The objection to the creation of such a special service bureau in the health department is the same as that offered against plumbing inspection and garbage disposal services in the health department. It tends to magnify the health importance of a service which is not of essential health importance and to put upon the health authority regulatory responsibilities which make it difficult to maintain a proper balance in public expenditure for productive health work.

The following citations from studies of health administration in two cities where health departments were made responsible for the regulation of building construction illustrate, in the first instance, the futility of regulatory ordinances, where the necessary enforcing personnel is not provided, and in the second instance, what a health department needs if it undertakes such regulation.

A municipal ordinance declares that: "Before any person shall build or commerce to build a livery stable or barn in which live stock is to be kept, a tenement house, slaughter house, rendering plant, garage, theatre or public auditorium, or shall commence, or attempt to transform any building into structures to be used for any of the above purposes, he shall file an application with the board of health, attached to which shall be detailed sketches, plans and drawings showing such proposed buildings or alterations to buildings. Upon such application being filed, the board of health or its duly authorized agent shall examine the same and determine whether or not such plans are sufficient for the purpose of protecting and conserving the health of those who may occupy such buildings and the adjacent territory affected thereby, and if satisfied that such plans are sufficient for the

foregoing purposes, the board of health shall thereupon give its consent to the construction of such proposed buildings pursuant to such plans. No person shall build any of the foregoing buildings or make any of the foregoing alterations without such written consent being first obtained."

Although this ordinance is believed to be a quite proper one, under existing conditions, it has become a dead letter through nonenforcement. Plans are neither submitted to nor examined by the board of health under any of the circumstances named in the ordinance.[2]

In 1914 the medical officer of health, feeling a need for the advice of a trained sanitary engineer, secured the appointment to the health department of a recent graduate of the Montreal Polytechnical School, who was a former employee of the Department of Interior of the Dominion Government. In order that this employee might receive special training in public health and sanitary engineering, he was sent to the Massachusetts Institute of Technology to take special courses there. During the period of his instruction, his salary of $1,500 was paid by the city. On his return in 1916, he was placed under the immediate supervision of the medical officer of health at the same salary.

Under by-law 260 it is required that plans and specifications of all buildings be submitted to the hygiene department, provided such buildings are to cost over $2,000. For buildings under $2,000 a description only is required. This by-law has, however, not been enforced in so far as submission of plans, specifications, and descriptions to the hygiene department is concerned. By a recent resolution of the board of control in conformance with the recommendation of the medical officer of health, it has been decided that all plans and specifications of buildings shall hereafter be submitted to the health department for review by the sanitary engineer with reference to location, plumbing, drainage, ventilation, lighting, etc.

In addition to the work required of the sanitary engineer in reviewing building plans and specifications, he has recently been called upon to prepare specifications and submit suggestions relative to refuse disposal, and to act also as consultant to the department of incineration when required.

It is impossible to make an accurate estimate at this time of the health value of this service because of the fact it is still in its inception. It is believed, however, that the service should be continued. A sanitary engineer with special training in the public health field should be of practical value to the medical officer of health in Mon-

[2] New York Bureau of Municipal Research, *An Administrative Survey of the City of Jamestown, New York,* 1916 (printed), p. 190.

treal, not only in assisting in drafting a new sanitary code, but also as a consultant on all matters relative to sanitary engineering. Provided there is an adequate building code covering all matters relative to the sanitary construction of buildings, there should be, however, no necessity for having plans reviewed by the sanitary engineer of the health department. The building inspection department should be charged with the full responsibility of seeing that the law is complied with. Until an adequate building code has been adopted, however, the procedure of submitting plans to the sanitary engineer of the health department should be followed and the sanitary engineer should be given an assignment to draft the sanitary features of this building code.[3]

But aside from the supervision of building construction which, we have said, should wherever possible be made a responsibility of a building inspection bureau or department, there are certain phases of building inspection which are of basic health importance and can be better done by the health department than any other agency. We refer to the inspection of buildings, chiefly dwellings, where there is evidence or suspicion that conditions exist which are conducive to the spread of communicable disease or otherwise contributory to ill health. The health department is better able to secure correction or amelioration of such conditions because of its extremely broad powers wherever health is endangered. Health departments generally, under their broad grants of power, may go much further in summary abatement of health dangers than is commonly permitted other municipal departments in their regulatory activities.

The following comment on housing conditions in Richmond, Virginia, illustrates the nature of the condition of house occupancy for the correction of which the health department is the agency of choice.

To say that housing conditions are bad in certain sections of Richmond is merely to state the obvious; every citizen who knows anything at all about Richmond knows it. There are many rooms occupied by negroes in which the sunlight never enters, and in these same rooms scores of other negroes have recently died of communicable disease; there are houses which are about ready to drop apart and are infested with all manner of vermin; there are houses without

[3] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Montreal, Canada,* 1918 (typewritten), pp. 1145-1146.

ordinarily decent facilities for washing or bathing, and there are houses in which promiscuity of sexual relations and consequent disease among their occupants are the direct result of the conditions under which they must live.

Hardly a stone's throw down the hill from the Jefferson Hotel is a row of negro houses of the two story and basement type. Their basements are far below the street level so that they are as dark as the tomb and always damp because of the drainage from the street level. They are dilapidated and broken down and apparently no repairs have been made on them in years. The rooms in these houses rent from 50 cents a week up to $3 a week, so that the total rental received varies from $12 to $16 for each house, a very satisfactory rental for wrecks of this kind. On Baker Street and Calhoun Street small shacks or cottages are found in no better condition than those described except that they are all above ground and get some of the sunlight. Along the Shockhoe Creek are found other negro "cottages" in an indescribably disreputable condition. On William Street, on Duval Street, and on St. Peter Street, similar conditions may be seen by anyone interested.

The question is not how bad they are because they cannot be worse, but what can be done about it? It is useless to talk vaguely about philanthropic plans for building beautiful rows of cottages for negroes, although even that is found to be good business rather than philanthropy by large industrial corporations. The only effective way to put an end to existing conditions is to secure such laws as will enable the health authorities to condemn and prevent the use of buildings unfit for human habitation. This has been done by other cities and can be done by Richmond if only the public has the will to do it. Any talk about putting these hovels in repair is nonsense, for the necessary repairs would cost far more than the houses are worth.

It is claimed that many of these houses which are unfit for habitation are owned by residents of Richmond who are themselves poor and must have the small rental from the houses. If this is true, special arrangements can be made to meet special conditions. But even if it is true, it is a poor explanation rather than an excuse for their present state. Richmond need not have bad housing conditions if it does not want them, and if Richmond wishes to encourage its colored citizens to remain in Richmond, it should at least guarantee them health protection through proper living conditions.[4]

In many large industrial cities the problem of housing sanitation is complicated by the existence of cheap lodging houses used

[4] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Richmond, Virginia,* 1917 (printed), pp. 533-534.

largely by the floating labor class. As these lodging houses are designed to furnish lodgings at the lowest possible rate consistent with profit for the proprietor, they are often of low sanitary standards. Since their patrons are mainly of the "floater" type, the dangers of disease transmission are apparent. Even in the most poorly constructed and equipped private dwelling there is far less likelihood of spreading disease than in these cheap lodging houses. The situation found in some of the cheap lodging houses of Montreal is typical of lodging house conditions in many cities.

Montreal has a few well-equipped lodging houses which are operated with due regard for cleanliness and decency, such as the Brewery Mission and the Protestant House of Refuge and Industry. These institutions are doing a splendid work and were found to be in excellent condition. At these places a small charge of 10 and 15 cents is made for lodging and the patrons are made as comfortable as the resources of the institutions permit.

There are about seventy-five private lodging houses in the city which are conducted for profit by private persons. Many of these are in St. Paul Street in basements below the street level, without light or air and filthy beyond description. In one of these visited by the investigator, two small rooms, both dark, one without any ventilation whatever, except by the door into a dark hall, contained twenty beds of the double deck type. The bedding was disgustingly filthy, as were also the floors and walls. The air was stifling, and there were no adequate facilities for cleanliness or decency. Nothing can be done with such a place except to close it up completely, until the necessary standards of cleanliness and decency can be met.

As a very necessary step in the prevention of disease, this lodging house situation should be remedied at once. A by-law should be passed fixing in all detail the sanitary requirements of such places, as to lighting, ventilation, cleanliness, toilet facilities, etc., and a lodging house which cannot, or does not, conform to these regulations should be summarily closed. The sanitary inspectors of the proposed division of preventable diseases should make regular inspections of these premises and special records should be kept of their findings.[5]

It would be a decided mistake to give housing inspection too great weight in disease prevention, and routine house to house inspection for the purpose of discovering conditions conducive to ill health is probably not worth what it costs. On the other hand,

[5] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Montreal, Canada,* 1917 (typewritten), p. 1239.

it is quite certain that the spread of certain communicable diseases is favored by overcrowding, inadequate facilities for personal hygiene, lack of proper ventilation and sunlight, overheating and underheating, etc. If the incidence of communicable diseases as reported to the health department is "spotted" on a city map, it is not unusual to find that many of the communicable diseases show a tendency toward sharp localization in certain areas of the city where housing conditions are worst.

It is an axiom of public health that persons and not things are chiefly responsible for the spread of communicable diseases, and we know that even where conditions of living are not generally favorable to health, the spread of disease may be checked by proper attention to the separation of the sick person from contact with others in the house. Yet it must also be recognized that the persons who, because of their social and economic status, must live or prefer to live in those parts of the city where standards of housing are low, are quite often the very persons who do not know how to protect themselves, or if they do know, cannot protect themselves against contact with others because of circumstances beyond their control. So it happens that high incidence of disease in a given part of the city is a reflection of bad housing conditions there. If, then, the spot maps of disease show a tendency to disease localization, special study of housing conditions in those areas is warranted.

The complaint procedure of the health department, if properly developed, should also furnish the health officer with a great deal of information on the housing situation. Housing complaints do not come from home owners, of course, but from tenants, and tenants as a rule, are reluctant to make complaints against landlords for fear of reprisals. If, however, the health department encourages citizens' complaints of housing, even anonymous complaints, and gives the complaining tenant or landlord reasonable protection of their confidence, the coöperation of both tenant and landlord can be secured. Relatively few tenants know what their health rights and duties are with respect to the houses they occupy. If the housing situation in the city warrants, it is good health education and promotive of good sanitary control, for the health department to publish information for citizen advice on the subject, with respect to the health rights of both tenants and landlords. The tenant is sometimes as much to blame as the landlord

for the maintenance of insanitary conditions, and the latter has as much right to complain as the former.

Instead of house to house inspection to determine where conditions warrant health interference, the health officer with limited funds at his disposal will do well, then, to focus his attention upon those houses and conditions of housing shown by the records of disease and the complaint register to be most in need of sanitary supervision. The health officer usually knows where housing inspection is most needed and what the special health dangers are to occupants of homes in a given area. If, for example, the area is one in which tuberculosis is markedly prevalent, a sanitary survey of homes within the area would no doubt indicate what official action should be taken to protect their occupants against environmental conditions conducive to the spread of the disease. If homes are in an area where, because of the lack of sanitary sewers or good water supply, dwellers are subjected to the health dangers of uncleanliness and improper disposal of human wastes, a survey should be made to determine exactly what the dangers are and how they may be eliminated. If the area is one in which the health problem is largely one of preventing overcrowding, a survey should be made to determine what the occupancy limits should be in such houses, and what other steps should be taken to minimize the overcrowding evil.

In one southern city studied by the writer, the communicable disease register showed clearly that the starting point of most of these diseases was in an area on the outskirts of the city adjacent to a city dump. On the edge of the dump were scores of small houses and shacks, overcrowded with negroes and poor whites, who eked out a precarious existence as scavengers. The houses were unsewered and without adequate water supply, and every possible discouragement to cleanliness and decency was evident. Yet, in spite of the fact that homes in this area were clearly in need of the most thorough sanitary supervision, they were carefully avoided by the sanitary inspectors because it was felt that the situation, which had long existed, was inevitable and unredeemable. So inspectors went about on house to house inspections everywhere, except in the very area where health dangers were greatest. A thorough survey of the conditions in these houses would undoubtedly have accomplished more for the prevention of disease than all other housing inspectional work elsewhere.

The health officer who is confronted by a situation such as the one described, might well turn his entire inspectional force over to a housing survey of the insanitary area and the development of such information about it as would awaken the public to the necessity of community action. The point of the illustration is just this—that good sanitary inspection of housing conditions, like inspection in any other field of public health, depends upon directing the inspector to the job which most needs to be done, rather than giving him an assignment to routine inspection in the hope that he may by chance happen upon a condition calling for official notice.

Sanitary Control of Privies

In many cities, particularly of the south, insanitary privies are a serious menace to community health. Hookworm disease, a disease common in southern states, is spread from one individual to another through the improper disposal of human excreta. As we have said, the hookworm enters the body of its victim mainly through the skin of the feet, hence the dangers of going barefoot in soil polluted areas. The contamination of water and milk supplies by typhoid bacilli or other intestinal bacteria is also a danger in such communities, and the ever-present fly and rat do their share in spreading intestinal infections. The best solution of the problem is the connection of all homes with sanitary sewers, but in many communities this solution presents practical difficulties due to the locations of the unsewered areas, and the cost of extensions of existing sewer lines, both to the community as a whole, and to the individual property owner. The latter may be financially unable to meet the cost of making the necessary sewer connections, even where sewers are available.

If connection with sanitary sewers is impossible, sanitary privies should be required. A sanitary privy is one in which the excreta is deposited in a suitable receptacle to which access by flies, rats, and other animals is prevented, and its removal and final disposal so carried out that soil pollution will be prevented, or if not prevented, will not constitute a health hazard. The privy may be so constructed that the excreta is deposited in a receptacle which can be removed periodically and emptied in a safe place or, if there is water connection, the privy may be connected with a cesspool. If the privy is connected with a cesspool, the cesspool should be thoroughly protected from access by flies or mosquitoes.

Privies without cesspool connection are of two chief types—the "dry" system and the "wet" system. The only difference between the two is that in the dry system the excreta, after being deposited in the receptacle, is covered with earth, wood ashes, or lime to prevent odors and fly contact, while in the wet system the receptacle contains some fluid which prevents fly breeding and favors fermentation and liquefaction of privy contents. Either system is satisfactory, provided the privy is properly constructed and care taken in its use and in the final disposal of the fecal matter. The wet system is favored chiefly because it is more effective in preventing fly contact with excreta. For a thorough discussion of the construction and maintenance of sanitary privies of the types above described, the reader should consult the several bulletins on this subject, of the United States Department of Agriculture and United States Public Health Service.

One style of the "wet" privy above described, is called the L. R. S. privy, from the names of the representatives of the United States Public Health Service (Drs. Lumsden, Roberts, and Stiles), who developed this type of privy and have promoted its wide use in unsewered areas. The L. R. S. privy in its most complete form, provides for the depositing of fecal matter in a liquefying tank which is provided with an overflow for the effluent. This effluent passes either into a removable receptacle from which, after disinfection, it can be emptied upon the ground, or better, run over into another tank from which it is passed through drain tile into the top soil. The effluent is easily disinfected and its disposal in this way is generally quite safe.[6]

Cesspools, which may be used where there is running water in the home, are also of two general types, namely, the "tight" and the "leaching" cesspool. The tight cesspool is used when the soil is not readily adapted to the filtration of the material, and the leaching cesspool where the contents of the cesspool may be allowed to "leach out" into the surrounding soil either directly or through drain tile. The leaching cesspool is practically the same thing as one type of the L. R. S. privy previously described, except that the former is always connected with a water carriage system. When the soil is heavy and does not permit ready filtration, several leaching cesspools may be arranged in series so as to provide for better liquefaction and more thorough fermentation

[6] L. L. Lumsden, C. W. Stiles, and A. W. Freeman, *Safe Disposal of Excreta at Unsewered Homes, Public Health Bulletin* No. 68, April, 1915.

of the contents. Either type of cesspool should be thoroughly protected against flies and mosquitoes. The tight cesspool should be cleaned regularly and its contents disposed of in a safe way.

Disposal of privy contents except where provision is made for its liquefaction and the escape of the effluent into the soil should be by frequent removal and burial not less than two feet below the surface of the earth. Before covering with earth, it should be sprinkled with chloride of lime or other disinfectant. The place selected for burial should be chosen with care so as to prevent any annoyance to dwellers from odors, or any contamination of food, water, or surface soil.

All privy contents must be regarded as dangerous and the health department should supervise its removal and disposal. The removal and disposal of privy contents is best done by the municipal government where there are many homes with privies, and that department charged with waste disposal generally should be responsible for administering the service. If the work is done by private scavengers, they should be licensed by the health department and their methods and equipment regularly inspected. There is always difficulty, however, in preventing nuisance when such work is done by private scavengers. A city maintained removal and disposal system should be, in part at least, self-supporting. Home owners should be required to secure permits to maintain privies and to pay a fee therefor sufficient to pay part, if not all, of the cost of service rendered by the city.

It is the custom, where construction work is being carried on, for builders to erect temporary privies for the use of workmen. In such cases, the health department should prescribe how and where they may be built and the conditions of use. Contractors should be required to submit plans of temporary privies to the health authority and to subscribe to the conditions imposed, with respect to their sanitary maintenance. The same general methods of privy construction and removal and disposal of its contents as have been described for privies at the home, should be insisted upon and guaranteed before a permit is issued by the health authority.

The same precautions with respect to privy sanitation should be carried out at other places, such as picnic grounds, motor camps, etc. With the development of temporary camps for motorists in many communities, the problem of preventing the spread of communicable diseases has been considerably complicated. Camp and public picnic grounds should in all cases be selected and sanitary

facilities installed only after the approval of the health officer. Flies are likely to be a special source of danger at such places, and the essential thing is to see that fly contact with human and other wastes is made impossible by thorough policing of grounds.

There is no other phase of sanitary control which is of greater importance than that of preventing the improper disposal of human excreta, and yet, one finds in many communities having large unsewered areas, that neither officials nor public are greatly concerned about the matter. The health authority cannot compel the home owner to build a privy of a particular type but he can declare that whatever type is built shall be safe. A sanitary privy can be built very simply and inexpensively and cared for very much more easily than an insanitary one. The health department of cities where the sanitation of the unsewered home is a problem, should make available to citizens plans and specifications for the construction and maintenance of sanitary privies. In the warm months particularly, special literature on the dangers of fly contact with privy contents should be prepared for distribution among citizens in unsewered areas.

Where sewers are available, property owners should be required to make the necessary connections. If they cannot afford this, the connections should be made at public expense and the cost assessed against the property owner in all possible instances.

Sanitary Control of Insect and Vermin Disease Carriers

Although the number of disease carrying insects and other animals is great, health authorities in this country are concerned chiefly with the prevention of the spread of disease by the house fly, the malaria carrying mosquito, the body louse, and the rat. The house fly is a universal pest and because of the rapidity with which it breeds, and its mode of life, is ordinarily the most dangerous of the common insect disease carriers. The malaria carrying mosquito (*anopheles*), is common in many parts of the United States and is responsible for a great deal of sickness, particularly in the south where conditions are favorable to its development. The body louse which is a carrier of typhus fever and of other communicable diseases, is chiefly dangerous where there is overcrowding of people under conditions which make personal cleanliness difficult, as in lodging houses, jails, barracks, etc. The rat is a health menace because he feeds upon filth which may be disease contaminated and he may, therefore, convey infectious organ-

isms to human food. The rat is also frequently infected with the *bacillus pestis* which causes bubonic plague, a most fatal disease in many European countries. The disease is spread to man through the bites of fleas which live upon the diseased rats.

Fly Prevention versus Fly "Swatting"

Control of the fly nuisance consists chiefly in eliminating their breeding places. Practically, this means prevention of improper disposal of stable manure, since all authorities agree that about 95 per cent of flies are bred in stable manure. The amazing reproductiveness of the fly makes fly "swatting" campaigns of little practical value, except as they are sometimes useful in awakening the public to the fact that flies are not merely annoyances but disease carriers.

The life cycle of the fly from the egg through the larval and pupal stage to the imago or fully developed fly is only about fourteen days, maximum, and flies begin to lay eggs within two or three days after full growth. The daily removal of manure from manure bins and its treatment by fly repressive agents would be an ideal way of controlling the situation in cities, but this is not practicable because of its cost. The alternative is for cities to require stable owners to use properly constructed, fly tight, water tight manure bins, and by official sanitary inspection to see that the fly nuisance is minimized. Treatment of the surface of manure piles with fly killing solutions is of little avail. The eggs are particularly resistent to most of these solutions, and besides the larvæ, when hatched, tend to migrate toward the lower, warmer, and more moist depths of the manure piles where they are not readily reached by disinfectants put on the surface of the manure. This tendency on the part of the larvæ or maggots has been taken advantage of in the construction of manure bin fly traps. The manure bin is supported on posts a few inches above the ground and instead of an impervious bottom, it has a screen heavy enough to support the manure and with a wide mesh. The larvæ migrating toward the earth, drop through the screen, are caught in a pan containing water, or other solution, which destroys them. According to reports of investigations conducted to determine the efficiency of this type of maggot trap, it is extremely effective, about 85 per cent of larvæ being destroyed when it is properly used.

Fortunately for public health, horses are rapidly disappearing from the cities, but in many cities stable sanitation is still a neces-

sary measure of fly prevention. Stable operators should be required to secure permits from the health authority and such permits should be issued only to those whose stables conform to proper standards of construction and operation. The health authority cannot define specifically by ordinance how a manure bin shall be built. It can, however, lay down general methods of caring for and disposing of manure so that reasonable protection against fly breeding can be afforded, and by inspection it can see that the stable operator acts accordingly. Preferably, removal of stable manure should be done by municipal authorities. If it is done by private individuals, it is usually not done in the summer months when frequent removal is most necessary to prevent fly breeding, because farmers who use manure as fertilizer do not want it then. Whether the work should be done by the municipality, or left to private individuals, will depend mainly upon the number of stables and the amount of inspection which would be required to guarantee proper stable sanitation under either plan.

Flies breed also in garbage and offal of all kinds but, as a rule, accumulations of such refuse are so offensive that they do not remain long enough to permit fly breeding except at garbage dumps. Garbage dumps should not exist, but they do exist in many communities, because it is a cheap way of disposing of garbage. The municipal garbage dump is, however, almost inevitably a public nuisance because of the practical impossibility of preventing the contact with it of disease carrying insects and rats.

Mosquito Control

In cities within zones of malarial prevalence, any accumulation of water standing for a few days may become the breeding place of millions of mosquitoes, many of which may be malaria carriers. It requires only about ten days under favorable conditions for the complete development of the mosquito from egg to adult. Large ponds and pools are the chief places of mosquito breeding, but small roadside puddles, rain water barrels, the eaves of houses, catch basins in streets, uncovered ditches, post holes, bottles, pails, tin cans, etc., in yards, or on public dumps, may contribute greatly to the mosquito nuisance. Fortunately, not all mosquitoes are disease carriers and in most communities of the North, the mosquito pest is the *culex,* which is not a malaria carrier. The *anopheles* mosquito is the malaria carrier,

and the *aëdes calopus,* the carrier of yellow fever. Yellow fever is, however, now extremely rare in this country, although epidemics of great magnitude formerly occurred in the southern states. Malaria is still a serious problem in the southern part of the United States.

Complete elimination of mosquito breeding bodies of water is the final effective way of getting rid of mosquitoes. Without such bodies of water, large or small, mosquitoes cannot breed. They do not breed in the casual water about long grass, weeds, etc., although such places furnish protection for the adult mosquito. Where mosquito breeding waters cannot be drained, or otherwise eliminated, oiling of the water is effective, if properly done. The oil spreads a film over the surface of the water and prevents the larvæ from breathing. It has also been found that stocking pools with larvæ eating, surface minnows helps considerably to keep down mosquito breeding.

Good control in malarious districts requires constant systematic inspection of premises, and emphasis on permanent elimination rather than temporary abatement of mosquitoes. Along with these efforts to stop mosquito breeding, there should be a continuing program of public education on the subject. There are still a great many people who do not believe in the mosquito "theory" of the cause of malaria. It is not uncommon, therefore, to find that although the more obvious places of mosquito breeding are sought out and control measures instituted, much of the trouble comes from the carelessness of home owners in allowing water to stand uncovered in rain water barrels, cesspools, eaves troughs, pails, tin cans, catch basins, etc. In a mosquito elimination survey which the author once conducted for a large institution, it was found that mosquitoes still persisted after all apparent breeding places had been eliminated. A resurvey revealed an old cesspool with a broken cover which was breeding almost as many mosquitoes as all of the other places eliminated. In malarious districts, screening of homes should be resorted to since, unless the mosquito has access to the malaria infected person, it cannot transmit the disease to another person. Destruction of mosquitoes by spraying with various solutions is helpful, but as long as they are permitted to breed, the destruction of a few of the many millions produced is of little permanent value.

Just what part the health department should take in mosquito elimination will depend upon the extent of the mosquito nuisance

and whether or not elimination is necessary for disease prevention. If malaria or yellow fever exists or is suspected, it is obviously the health department's business to take steps to prevent the spread of disease by destruction of the mosquito disease carriers, and other measures directed toward the protection of the patient from mosquito contact. If mosquitoes are merely an annoyance, and their elimination is sought as a measure of public comfort, the health department may well give special attention to the matter in the course of ordinary inspectional routine; but when the work involves extensive operations of a highly specialized nature, it is preferably not undertaken by the health department. The New Jersey plan of creating county mosquito exterminating commissions is perhaps the most satisfactory where many communities are involved. Local health authorites should of course coöperate with special commissions of this character and should police their own jurisdictions as far as this is possible in the course of their general inspectional work. As we have said, a great deal may be done by local health inspectors to prevent mosquito breeding which occurs about houses, and this should be done as a matter of routine, whether the mosquitoes so bred are disease carriers or not.

"Lice Reservoirs" and Their Sanitary Regulation

The body louse is the carrier chiefly of typhus fever, and another acute infectious disease, the trench fever of the great war. Typhus fever is fatal in a great many cases. It occurs in two forms, the epidemic form, and the endemic form. The epidemic form is the more severe in its symptoms and more fatal in its outcome. The epidemic form of typhus fever is rare in this country, and there has been no epidemic of the disease in the United States since 1893. The milder, endemic form of the disease, called Brill's disease, appears constantly in many of the largest seaport cities where it is brought from typhus infected areas in continental Europe.

Since the body louse is known to be the chief carrier of these diseases, the health problem in most cities is the supervision of the "lice reservoirs" of the community, which are chiefly the cheap lodging houses. The health department cannot, of course, enforce personal hygiene in such places unless they are under municipal operation and control. It can, however, insist that all lodging houses be so equipped as to make personal hygiene possible, and permit the clean lodger to stay clean if he chooses to do

so. It is well-nigh impossible to provide a health supervision of cheap commercial lodging houses which will safeguard the lodger against body lice. In municipal lodging houses, however, this is quite possible, since the lodgers' submission to delousing procedure should be a condition of their admission.

The Rat a Serious Menace

Rat prevention is essential both on health and economic grounds. The rat is frequently infected with the plague bacillus, or *bacillus pestis*. The fleas which live upon plague infected rats may transmit the disease to man. The disease is rare in this country because of the strict quarantine against rats at American ports. Ships from regions where plague occurs are thoroughly fumigated under federal supervision and are required to place rat guards upon their hawsers when at dock, to prevent rats from getting on or off of the ships.

The rat is also the host of a parasitic worm which is frequently found in hogs also. The hogs probably become infected by eating rats or rat contaminated offal, and man becomes infected by eating pork containing the larvæ of the worm. The disease, *trichiniasis*, which takes its name from the worm, *trichnia spiralis*, is very fatal in man. Prevention of the disease in man is, therefore, mainly a problem of rat elimination, and particularly, the eradication of rats at slaughter houses, stock yards, butcher shops, etc.

Even if all health dangers from rats could be discounted, rat elimination would be well worth while on economic grounds. Millions of dollars worth of property are destroyed yearly by rats. They cause fires, destroy crops, pollute food and water, ruin foundations, eat eggs and wound poultry, spoil garments, rags, carpets, draperies, etc. Rat destruction is, however, difficult because of the great vitality and shrewdness of the animal and his resistance to most poisons. The most effective method of getting rid of him is to cut him off from his food supply by rat proofing all places where he might otherwise obtain food. Fumigation has been found useful in closed areas, as in the holds of ships, but it is not of value in many other places because of escape outlets to rat burrows. Efforts to destroy the rat by bacterial viruses have generally failed. Trapping, poisoning, and other methods are sometimes successful if the work is done by trained exterminators. Half way measures are of little avail.

Every building code should contain regulations relative to rat

proofing. Such regulations should be enforced by that bureau or department responsible for building inspection. Health department efforts should be directed mainly to the protection of food from rat contact in slaughter houses, markets, etc., and in preventing the disposal of garbage in such a way that rat breeding is encouraged. The rate of rat propagation is considerably reduced by their starvation. In shipping centers, local health authorities should coöperate with federal authorities in enforcing rat quarantine. For the average community, rat prevention and control simply means municipal cleanliness and good municipal housekeeping. Filth and rats are usually found in association.

The Sanitary Supervision of Water Supplies

Fortunately, in the great majority of cities properly controlled, public water supplies are available for the greater part of the population, either under the management and control of a municipal water department or of a private agency. The health department's responsibility for the safety of public water supplies should be limited in the main to the examination of evidence of its quality, particularly as to its bacterial content, and to special investigations of other contamination as may be indicated. In most cities bacteriological tests of water are made by the private operating companies or municipal departments of water supply. The health department should, however, even in such cities, insist upon having from such companies or city departments reports of the sanitary condition of the public supply in order that it may make prompt investigation upon evidence of unusually high bacteria content, or other contamination. If no bacteriological tests of water are made by the agency controlling water distribution, they should be made by the health authority.

In a great many cities private wells and springs are made use of for drinking water supplies by citizens who find it convenient to do so, or who believe, usually erroneously, that certain well waters have peculiar merits not found in the public supplies. Many of these wells and springs are of surface origin or are fed by surface waters, and it is easy for them to become contaminated, either by drainage from polluted soil or from the seepage through well platforms of filth from the feet of persons and animals. Good sanitary control requires supervision of such wells and springs, and the prompt closure of them when they are shown to be contaminated or in danger of becoming so. The use of private wells

and springs is always to be regarded with suspicion in the case of typhoid fever prevalence.

In every city where there are private wells and springs in use for drinking purposes, a survey should be made of all of them and their location spotted upon a city map, so that the incidence of communicable water borne diseases can be checked against these locations. In this connection, it should be noted that wherever typhoid fever is prevalent and there are a large number of cases of "unknown origin," that is, not clearly traceable to their sources, the use of private wells and springs should be thoroughly examined. A spring or well which is ordinarily good may become contaminated at certain periods, or under certain conditions of use without the users being aware of any danger.

In the city of Columbus, Ohio, at the time of the writer's study, several years ago, there were about 2,500 private wells and springs in use. Typhoid fever was prevalent at the time and many of the cases were recorded as of "unknown origin," although it seemed quite probable from their location that the use of these private water supplies was responsible for some of these cases. No complete survey of these water supplies had, however, ever been made, nor was there any adequate inquiry with respect to their bearing upon the typhoid situation. In Richmond, Virginia, also, a similar situation was found. In one instance in this city, the writer found several people obtaining their drinking water from a spring at the edge of the road, which was unprotected in any way and constantly exposed to contamination from surface drainage. In another study of the water supply of a large institution, it was found that although the general supply was from deep drilled wells and excellent in character, many of the employees of the institution preferred to use water from a spring below the road level. This spring had a great reputation for the quality of its water, and people came long distances to make use of it. Several cases of typhoid fever and other intestinal disorders among its users, which could not be explained otherwise, centered suspicion on this spring. Bacteriological test showed the water to have a high content of colon bacilli, which are normal inhabitants of the intestines of human beings and lower animals. The water was obviously unsafe and although the spring was closed, there was great protest against its closure. The result was, however, that the prevalence of typhoid fever and other intestinal disorders among users of the water was checked.

Miscellaneous Sanitary Control Activities

The use in public places of common towels and common drinking cups is usually prohibited by municipal ordinances, but enforcement is often poor. Fortunately, the public has become so familiar with the health dangers from these sources that the common towel and the common drinking cup have well nigh disappeared, except, strangely enough, in municipal buildings and offices. The writer has observed more violations of such regulations in municipal buildings than in other public places—and some of the worst violations were in the health office directly under the eyes of the health officer. The dangers of transmitting serious communicable diseases from such sources should not be minimized. Infections of the skin, of the eyes, nose and throat infections, and in fact almost any one of the readily communicable diseases may be transmitted in this way. Health inspectors, policemen, and all other inspectional forces should be instructed to note violations of ordinances regarding common drinking cups and common towels, and report them to the health officer.

Promiscuous spitting in public places is also prohibited in practically all municipal sanitary codes, but enforcement is rarely good. The usual procedure is for the police to make an occasional "round up" of spitters, and then to forget about the matter until the next round up. This procedure, if given good publicity in the newspapers, has a temporary value, but the effect is not lasting. It is difficult to enforce regulations against promiscuous spitting, but if the health officer emphasizes the health dangers from the practice in public statements to the papers, health bulletins and otherwise, the public can generally be depended upon to help in checking it. The spitter is undoubtedly a health menace, but since disease germs which may be contained in the sputum are usually killed by exposure to drying, it is probable that the health dangers from spitting in exposed places are not great, except that many serious communicable diseases, as well as common colds, are transmitted by the spitter through the spraying of those near him with sputum droplets. Coughing and sneezing are perhaps more responsible for disease transmission in this way.

The sanitary supervisor of barber shops is also of considerable health importance in view of the ease with which communicable diseases, particularly of the skin, may be spread by the use of unclean brushes, combs, towels, razors, and other instruments and

appliances. Control of such establishments consists in the enactment of an ordinance defining the conditions of their operation and requiring that they be licensed annually by the health authority on the basis of inspection. The use of score cards for barber shop inspection is recommended, and those maintaining high standards should be granted certificates of excellency which should be conspicuously posted on their walls. All barber shops under inspection should be required to pay a fee for license which will cover the cost of inspection.

Public baths and swimming pools may become serious menaces to the health of users if they are not properly constructed and maintained. It is not the business of the health department to administer municipal baths and swimming pools but merely to see that they are so equipped and conducted that community health is protected. Swimming pools, particularly, may become seriously contaminated from the bodies of users, even when the greatest care is taken to ensure that bathers are free from disease, and cleansing baths are taken before entrance into pools. The most satisfactory plan of preventing disease dangers in swimming pools is continuous disinfection of the water by the use of liquid chlorine, even where there is frequent change or refiltration of water. Efficient equipment for this purpose can be had at relatively small cost, and recent studies have shown that if it is properly used under control by chemical tests of chlorine content of the water, bacteriological tests of the water are not necessary.[7]

Public comfort stations also require health supervision to ensure that, through improper construction and equipment, or careless use, flies or rats may not have access to human excreta, and in order that the food or drink of others may not be contaminated from the hands of users of the toilets. Thorough sanitary control of public comfort stations in connection with public markets is of great importance because of the obvious dangers of food contamination by these means. The following description of the toilet at a municipal public market illustrates what may happen in such places where good sanitary supervision is lacking.

> The most filthy condition imaginable was found in a toilet used by colored males only. This toilet is in a small brick outhouse at the northern end of the armory. The door of this was locked when

[7] W. D. Stovall, M. Starr Nichols, and Vera E. Vincent, "Renovation in Swimming Pool Control," *American Journal of Public Health,* March, 1926.

visited, the key being in possession of the clerk of the market who had apparently not seen the inside of the toilet for some time, as he expressed surprise at the condition found. The walls, floors, and ceiling of this place beggar description. Urinals had overflowed all over the floor so that the floor was soggy and reeking with urine. The closets, which consisted merely of a trough with several seats, were filled with fecal matter, although there is an automatic flushing device connected. The floor beneath the trough, as well as the seats themselves, were covered with excreta of human beings and rats. There were no facilities whatever for washing the hands. Ventilation was bad and it was impossible to stay in the place without nausea. When it is realized that the users of this toilet are the negro customers and negro occupants of market stalls, the menace of food contamination is at once apparent.[8]

The need for public comfort stations under municipal control has not been properly met in any city with which the writer is familiar. Prior to the abolition of the saloon, the need was met, in part at least, by the saloon toilet. The subject is one to which public authorities may well give attention, particularly in the large cities. A great deal of study has been given to this problem chiefly by private civic associations and commercial organizations, but municipal authorities generally have done very little to meet the situation. Professor William T. Sedgewick, one of America's greatest sanitarians, said in his presidential address to the American Public Health Association, in 1915: "Probably the most flagrant failure in American sanitation to-day is the almost universal lack of public convenience, or comfort stations, in American cities and towns. Failure to provide public toilet facilities in our towns and cities is to fail in one of the very elements of sound public health service." The situation described by Professor Sedgewick in 1915 is worse to-day in many cities because of the disappearance of the saloon.

Smoke nuisance in many large industrial cities is probably a much greater menace to community health than is commonly supposed. The inhalation of soot contributes no doubt to many nose and throat irritations which lower the normal resistance of the respiratory organs to infectious diseases.[9] Indirectly, smoke may cause health damage through decreasing the amount of sunlight,

[8] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Richmond, Virginia,* 1917 (printed), p. 608.

[9] Mellon Institute of Industrial Research and School of Specific Industries, Pittsburgh, *The Influence of Smoke on Health,* Bulletin No. 9, 1914.

retarding plant growth, and otherwise by its depressing influence upon mind and body. In some cities where smoke prevention is a major problem, special smoke inspection bureaus have been established independently of health department control. In most cities, however, the work is carried on, if at all, by health departments. If smoke prevention calls for constant supervision of many large industrial and commercial plants, it is better to have inspectional work done under the auspices of some other department than the health department. In the average small city, however, the health department may well take the responsibility for smoke prevention.

Prevention and control of smoke nuisance requires, first, the enactment of a good ordinance specifying the degrees of density of smoke emission which constitute violations, and the duration of time of emission of smoke of the various densities which is permissible under the law.[10] The standards of density of smoke are commonly defined in the law according to the Ringelmann scale which defines four grades of smoke density. The grades are shown on charts "cross hatched" with black and white lines so that chart 1 is equivalent to 20 per cent black; chart 2, to 40 per cent black; chart 3, to 60 per cent black, and chart 4, to 80 per cent black. Inspection of smoke as emitted from smoke stacks is then carried on systematically and the density of smoke emitted is compared by the inspector with the Ringelmann scale charts in order to determine whether or not violation occurs.

The efficiency of any system of smoke prevention and control of the smoke nuisance depends, however, rather upon the development of coöperation among plant operators than upon rigid enforcement of law, although this is necessary in many instances. Smoke represents a considerable economic loss in fuel value and it should be the aim of the inspection force to impress this fact upon the operators. A great deal of this loss can be avoided by suitable selection of fuel, by the installation of automatic stokers, by careful hand stoking and other procedures about which the inspector should be competent to advise the operator.

The Handling of Citizen Complaints

Much of the nuisance inspection required of health departments is done in response to citizen complaints. Many of these com-

[10] Lucius H. Cannon, *Smoke Abatement, A Study of Police Power as Embodied in Laws, Ordinances, and Court Decisions*, St. Louis Public Library Bulletin, August-September, 1924.

plaints have no bearing whatever on community health, but represent merely citizen reaction to annoyances which he properly believes calls for official action. The citizen has a right to complain when his health, comfort, or safety is impaired by official or unofficial disregard of his rights, and his complaints should be heard and properly dealt with by some official agency. If, as is often the case, a complaint comes to the health department which can be better dealt with by another city department, it should be referred promptly to such department and the person making the complaint should be notified of the health department's action. If the complaint is one to be dealt with by the health department, it should be promptly and thoroughly investigated and a complete report made of the procedure from beginning to end. In view of the fact that so much of the time of sanitary inspectors is taken up in the investigation of nuisance complaints, it is highly desirable that effort be made to determine as far as it is possible to do so, the value of the work in community health protection, and to this end detailed records of complaints are necessary. Not only are such records necessary for purposes of administration but also as evidence which may be needed in legal action against those maintaining nuisances.

The health authority profits by good handling of citizen complaints even though no direct health benefit may result from the correction of nuisances complained of. The citizen who makes a complaint to the health authority and finds that complaint promptly and intelligently taken care of, is quite likely to feel that his health interests are in good hands, and he is inclined to support the department more generously and to coöperate with it in other matters. The average citizen is likely to appraise the value of his government agencies by the consideration which they give to his personal comfort and happiness. Citizen complaints should, therefore, be encouraged rather than discouraged. It is easy enough to discourage complaints by inefficient handling of them but this is certainly not in the interest of public health education. In many instances the health officer finds that the thorough investigation of citizen complaints reveals defects of health administration which otherwise might never be disclosed.

Good procedure in handling complaints consists first of all in their proper registration, and second, in the recording of all facts with respect to departmental action. A good complaint record should give the following information: (1) date and hour com-

plaint was received; (2) how received (letter, telephone, or verbally); (3) file reference (if complaint was by letter); (4) nature of complaint; (5) name and address of complainant; (6) location of nuisance; (7) name and address of owner or agent of premises; (8) inspector to whom complaint was referred; (9) date and hour of reference to inspector; (10) date and hour of investigation by inspector; (11) findings of inspector; (12) action taken by inspector or recommendations to superior officer; (13) reinvestigation, date and hour, and (14) final action taken and result.

As soon as a complaint is received the clerk or office assistant should enter on the register all the facts obtained prior to investigation. A complaint investigation form should then be made out with the information needed by the inspector and the date and hour of reference to the inspector. The inspector should then make his investigation and enter on the form all other facts desired for registration and return it to the registry clerk for permanent entry. The clerk should prepare and send to the proper officer, a memorandum of complaints on which further official advice is necessary and when such action has been taken, this memorandum should be returned to the clerk for entry in the permanent record. If reinvestigation is necessary, a reinvestigation order should be given the inspector who should return his findings to the clerk. If such record of the handling of complaints is provided, the health officer can determine at a glance, the exact status of each investigation and the results obtained.

The classification of complaints according to their nature and location helps the health officer to determine what and where his problems are in municipal sanitation. If, for example, he finds that a majority of his complaints have to do with the handling of garbage, it indicates that there is probably something wrong with the management of the garbage disposal system, and it is proper for him to call it to the attention of the head of the city government, not alone in order that the system may be improved, but in order that the health department may be relieved of the burden which the system's inefficiency puts upon the health organization. If a large number of complaints are of fly nuisance, the necessity of more satisfactory measures for fly elimination through better regulation of the disposal of manure may be indicated. If many complaints are heard of mosquito nuisance, it may appear that there are breeding places in the community which call for the adoption of organized municipal effiort to eliminate them.

Investigation of nuisance complaints should be prompt, not alone because the citizen has a right to prompt attention but because delay of investigation may prevent discovery of conditions of considerable health significance. Let us suppose that a complaint is made by a citizen that human excreta is being deposited contrary to law in a place and under conditions which are dangerous to public health. Delay in investigation may make it impossible for the inspector to obtain evidence of the violation of the law and to take the necessary action to prevent further health menace. The method of organizing and equipping the sanitary inspection force for prompt and efficient complaint investigation will be discussed in a later section.

The Coöperation of the Police in Nuisance Inspection

In considering measures for the more economic use of public health funds, the employment of policemen in nuisance inspection and control has frequently been suggested. A few cities have attempted to bring about police coöperation to this end, but in most cities police coöperation for health maintenance is negligible. There is no special reason, however, why the policemen on their beats should not be held as responsible for preventing violations of health laws as violations of other laws. Yet, it is extremely difficult, apparently, to convince the average police head in these days of "crime waves" that he has anything in particular to do with the violations of sanitary regulations unless such violations are particularly atrocious. If policemen can be used as nuisance inspectors without interfering with their availability for the prevention and detection of crime, it is possible to reduce the cost of nuisance inspection considerably and, in many instances, insure more prompt correction of insanitary conditions than in any other way.

Although policemen are the most valuable aids in nuisance control, inspectors and investigators of other departments can also be similarly utilized. It would not be good practice for a policeman or other officer to go out of the way of his regular duty to make sanitary inspections. On the other hand, if he were properly instructed, he would know what to look for on his tours of duty and what action to take, either against the individual on the spot, or after reference of the case to the health authority. There are many insanitary conditions and practices which could be more readily prevented by a policeman in uniform than by any

other inspectional agent. The people in every community, who are chiefly responsible for the maintenance of street nuisances, are usually more impressed by the policeman's baton than by any other symbol of authority.

To illustrate how the police and other municipal inspectors could be utilized for nuisance prevention, the following excerpt from a report on health administration in Richmond, Virginia, may be cited.

> Although it is stated that the coöperation of the police and inspectors of other city departments with the health inspectors is excellent, no definite plan of coöperation has been devised. The sanitary inspectors are required to spend much of their time in making inspections which should be made by the policemen and inspectors of other departments on their regular tours. The former health officer called attention to the need for some plan of formal coöperation in his report for 1916, but no steps have been taken to put his suggestions into effect.
>
> First of all, policemen particularly, and other inspectional forces of the city, should be required to familiarize themselves with the sanitary code and with the rules and regulations of the department. This should be done in the case of the police, particularly, as a part of their regular training, and a complete copy of the sanitary code and the rules and regulations of the department should be furnished each policeman or other inspector. This means a complete revision of the sanitary code and its publication in compact, pocket-size form. The policeman should know his sanitary code as well as he knows his police manual, and it should be his duty to arrest violators of the sanitary code just as it is to arrest violators of the police regulations.
>
> To bring about the coöperation of all agencies of the city engaged in inspectional or investigational work, it is suggested that a uniform report form be prepared which may be used by policemen, gas inspectors, firemen, visiting nurses, and social workers, etc. The accompanying form is suggested, to be modified as may be required.
>
> In making use of this form on which all of the conditions needing correction should be listed and numbered, the policeman or other inspector should check the condition noted on the upper half of the form. Below under the heading, "No.," he should place the number corresponding to the condition found. If two or more insanitary stables were noted, he should list each. Under "Location" he should give the address of the premises; under "Owner or Agent" the name of such person, and under "Address Owner or Agent" the place where such person may commonly be found. In the event that the condition is corrected by personal action of the police officer or other

Report to Health Department of Conditions Requiring Correction

Conditions to be noted—Please put check mark (√) after condition observed

No.	*Condition*	*No.*	*Condition*
1	Insanitary stables	7	Insanitary handling food .....
2	" alleys	8	" handling milk .....
3	" premises	9	" plumbing .....
4	" dry closets	10	Mosquito breeding .....
5	" wells	11	Etc. .....
6	" garbage	12	Etc. .....

No.	*Location*	*Owner or Agent*	*Address Owner or Agent*
1	516 Jones Street	J. T. Smith	123 Gray Avenue
7	217 Main Street	W. B. Brown	217 Main Street
4	17 Williams Street	F. L. Taylor	423 Avenue B
10	84 Grand Street	T. C. Philips	84 Grand Street

Signed.....

Date.....

officer, note should be made on the back of the form to that effect. These forms should be signed by the officer and turned in to the department of health daily, where special assignments of health inspectors may be made as required.

By special ordinance the police could be given authority to serve notices upon owners or agents. If this is done, there should be space provided on the card for data regarding the serving of such notices, and for reinspections by police or other inspectors.[11]

The Organization and Management of Sanitary Inspection Work

As in the case of all other major units of the disease preventive service, the sanitary bureau or division should be under the direction of an experienced chief sanitary officer responsible directly to the head of the health department or bureau. If the community is small and the organization of such a special unit unnecessary, one or more lay inspectors under the personal direction of the health officer will suffice for the investigation of citizen complaints and routine nuisance control. In a large city where a considerable force of inspectors is necessary, it will probably be difficult for the health officer to give his personal attention to their direction and the special bureau or division with its chief or directing officer is required.

[11] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Richmond, Virginia*, 1917 (printed), pp. 575-577.

The usual plan of assignment of the sanitary inspection force is by districts. The city is divided into a number of districts, and to each district an inspector is assigned and required to do all that may be required in his district, both in the investigation of citizen complaints, and routine house to house inspection of premises. In many cities it has been the practice to use the city ward lines as sanitary district boundaries. The ward is a convenient and well recognized unit of local government but it has no significance as a sanitary inspection district. When the ward is the district, it is to be expected that there will be at least as many sanitary inspectors as wards and this often results in putting health service squarely into ward politics. Appointments of ward sanitary inspectors become of interest to the ward politicians, and the question whether such appointments are necessary for health protection may be ignored. In the writer's experience, at least, the appointment of sanitary inspectors on a ward basis has resulted more often than not in burdening the health department payroll with more sanitary inspectors than are needed, and in the selection of men whose chief qualification is their political affiliation and availability.

A more satisfactory plan than that above described is to assign one or more inspectors for complaint work only, and the balance of the force to districts in number and of a size which will represent fairly the routine inspectional needs. For a city, let us say of 100,000 population, one or two inspectors would be sufficient for complaint work only, and three to four inspectors for district duty. Complaint investigators should preferably be mounted either in automobiles or on motorcycles so that they may cover a wide range of territory promptly. If there are two complaint investigators or more, they should also be assigned by districts so that their work may be properly routed.

Instead of having the general district inspectors permanently assigned to routine house to house investigation, which may or may not discover conditions detrimental to health, it is better, perhaps, to assign them to special surveys of known health nuisances in their respective districts. For example, in the fly breeding season a special survey might well be made by each district inspector of conditions favoring fly breeding in his district. On the basis of the information obtained from such surveys, a city wide program of fly prevention could be developed. If there were many unsewered homes, a thorough survey might be made of all such homes to

determine what health dangers existed and what action should be taken, not only to correct insanitary conditions in individual cases, but to secure the necessary development of sanitary sewer lines. If housing conditions in certain parts of the city were known or believed to be conducive to the spread of disease, a thorough survey of such conditions would help to determine what action should be taken, not only to correct individual housing defects of a remedial nature, but to determine city policy with regard to the occupancy of all houses which cannot be so maintained as to give occupants reasonable opportunity for cleanliness and protection against disease.

In sanitary inspection, as in other types of health inspectional work, the efficiency of the inspector depends largely upon the direction and supervision of his work. If sanitary inspectors are permitted to roam about in their respective districts without direction, they are not likely to accomplish much of real health value. Good procedure requires that they be required to appear at the health office each morning to report on the previous day's work and to receive instructions for the day just begun. Inspectors should spend no more time in the office than is required for them to make their reports and obtain their assignments.

The chief inspector should not be a mere office director, but should himself take the field and leave as much office work as possible to lower salaried clerks. It is not uncommon to find a chief sanitary inspector and perhaps one or two of his force engaged in routine office work which could be better done in most instances by an executive clerk at about half the cost. Complaints must be received and properly registered and assignments to inspectors made. Records of investigations and reinvestigations must be properly filed, applications for permits received and recorded, reports summarized for the review of the chief inspector and information furnished citizens on many matters. It may fairly be said that one good and experienced clerk in the office is worth at least two inspectors in the field. When such clerical service is not provided, it will be found nine times out of ten that there is inefficiency and extravagance in the use of health funds for sanitary control.

Although good sanitary inspection work calls for the employment of men who are physically fit and mentally alert, the salaries offered by health departments in this service are generally too low to attract the type of man desired, through salary alone. Few departments pay more than $1,500 a year for sanitary inspectors, and $2,400 is

about the average for supervisory officers. In consequence, the sanitary force is quite often made up of men past the active period of life and below the desired standard of physical and mental competency. It is by no means rare to find that the policy of the city government is to utilize the health department as a place of employment for superannuated workers in other city departments, in lieu of pensioning them or otherwise retiring them from public service. Whatever merit such policy may have as a substitute for a definite retirement plan, it certainly does not contribute to high efficiency of the public health service. This is possibly one reason why public education on the relation of nuisances to the causation of disease has made no greater progress. The age old notions that disease is "bred" and disseminated by things offensive to sight and smell regardless of their association with living disease carriers, are abandoned slowly in any case. If the sanitary inspectors have reached the age period when there is a natural tendency to discount the new ideas and new ideals of public health and to cling to the time honored traditions of sanitary inspectional values, they are not likely to be useful as teachers of others.

It is the writer's judgment from his study of sanitary inspectional work in many cities, that its relatively low value in disease prevention is largely due to an overemphasis on regulating, and an underemphasis on public education. It would be far better to have three young, alert, sanitary inspectors with enthusiasm for health education at $2,400 a year, than six old plodders at $1,200 a year who regard themselves merely as reporters of infractions of nuisance regulatory laws, and whose chief effort is to record a great total of inspections performed. There is a splendid opportunity in this field for young men wishing to qualify themselves for public health work. No better preliminary training in public health could be offered a young man than a year or two as a sanitary inspector. Good publicity on the subject would, it is believed, permit health departments to fill vacancies as they arise, with younger and more valuable officers.

CHAPTER XIII

THE PUBLIC HEALTH LABORATORY

The health laboratory is an indispensable unit of the municipal health department, whatever the latter's general organization form. The chief functions of the laboratory are: (1) the examination of specimens of body tissues, secretions and excretions of persons having or suspected of having disease, to determine the existence and diagnosis of the disease, the extent of infection, the nature of treatment required, and in the case of communicable diseases, the preventive and control measures necessary to limit danger to others; (2) the examination of water, milk, meat, and other foods to determine their freedom from contamination or adulteration by disease organisms or other harmful agents, and to furnish evidence with respect to their conformity to legal standards. There are other kinds of examination which health laboratories are frequently called upon to perform, such as tests of disinfectants, drugs and chemicals, air, sewage, etc., but these represent occasional rather than routine work.

The Laboratory in Communicable Disease Control

Any efficient system of control of communicable diseases must adapt its general and special procedures to the conditions which are imposed by the nature of the disease itself. It is, therefore, absolutely necessary that the diagnosis of the disease shall be made as soon as possible, so that the specific control measures for the disease may be promptly applied. Diagnosis of communicable diseases may, in some instances, be readily made by the attending physician, from the signs and symptoms exhibited by the patient. In other instances, positive diagnosis is impossible except by the actual identification of the causative organism of the disease in the blood, tissues, secretions, or excretions of the patient. This, then, is the first and most important aim of the health laboratory, namely to make available to physicians of the community, and to the health authorities, prompt diagnosis of cases of communicable disease

over which the health department is required to exercise supervision. Obviously, such a service is not only of great advantage to the physicians of the community in the management of their patients, but an advantage, also, to the community by making health control more prompt and effective.

The usual practice is for the laboratory to furnish physicians with outfits for the taking of specimens from suspected cases of diseases. For the convenience of physicians, many health departments in large cities maintain laboratory supply stations in drug stores or other places throughout the community. The physician obtains the necessary outfit either at the health laboratory or at one of the substations, takes the specimen from the patient and returns it either directly to the laboratory or to the station. A daily round is made of the supply stations by an agent of the department who collects all specimens and takes them to the laboratory for examination. Where supplies are furnished to physicians from neighborhood stations, it is a highly important part of the procedure to have the stations always under laboratory control. If they are not properly supervised by the health laboratory, there may be considerable loss through the deterioration or misuse of supplies.

When the specimen has been received at the laboratory, together with its accompanying slip giving the facts necessary to identify the patient and physician, it is prepared for examination by a special process depending upon the nature of the material and the disease suspected. It is then examined by the laboratory diagnostician, who records his findings upon his own record sheets, and upon a memorandum report which is returned to the physician. The official in charge of communicable disease control procedure is also notified of the laboratory's findings so that he may take such action as may be indicated.

Since the communicable disease control is so largely dependent upon the information which only the laboratory is competent to furnish, it follows that its diagnostic work must be done by persons thoroughly trained in the necessary procedures. If the physicians of the community are not able to rely upon the reports of the laboratory, they are not likely to use its services freely and, in consequence, many cases of communicable disease may not come to the notice of the department. The prompt reporting of communicable diseases by physicians is, as has been noted, the first essential of good disease preventive work. Reporting of disease is invariably better where good laboratory service is provided.

Many suspected cases of communicable disease, which might otherwise not be reported at all, are brought to the attention of the health department by the physician who is in doubt about the diagnosis, and wishes the laboratory's report for his own advice regarding the medical management of his patient's sickness. He may not feel that an official report of the patient's illness is called for until he has satisfied himself of the diagnosis, even though the law may require him to report "suspected" cases of communicable disease. If, however, his diagnosis and regimen of treatment waits upon a microscopic examination, he is quite likely to ask for the health laboratory's report much earlier in his treatment and this, of course, permits the health department to take more prompt action when such reports are "positive," that is, establish the existence of disease.

Where vaccination of school children is compulsory, the health department may either furnish the vaccine free of charge to private physicians, or have the vaccinations done by physicians of the department. Several other preventive vaccines, antitoxins, and prophylactic agents are also furnished free by some health departments, such as diphtheria antitoxin, and toxin-antitoxin, antirabic vaccine, typhoid vaccine, tetanus antitoxin, silver nitrate solution for use in the eyes of the new born, etc. In any case, the laboratory should keep a stock of the various preventive materials on hand for distribution to physicians in emergencies or in cases where patients are too poor to pay the cost. Whatever the policy of the department, with respect to the general free distribution of preventives for communicable diseases, it is highly desirable that smallpox vaccine, the toxin antitoxin preventive for diphtheria, and prophylactic solutions for the care of the eyes of the new born, be furnished free to physicians, regardless of the circumstances of their patients. Although the cost to the patient for these substances is not considerable, their general use can be much more widely extended if they are furnished free, the comparatively small cost to the community which such free distribution entails being offset by the gain in community health protection.

The laboratory should be held responsible for control of all serums, vaccines, and other prophylactic agents furnished to private physicians, or to physicians of the health department. A special register should be kept in the laboratory showing the amount and character of material used, the date of issuance, the name of the person, physician, or other to whom it was issued, and where pos-

sible, the name of the patient under treatment, and the other facts about treatment. Such a record is necessary to prevent abuse of the service offered.

Laboratory Tests of Water

As previously indicated, the health laboratory must be prepared to make examinations of all sources of water supply, chiefly for the purpose of determining its freedom from bacterial contamination. The health department is not necessarily concerned about the chemical constituency of water, except as chemical tests may furnish supplementary evidence of the existence of organic chemical substances, chiefly nitrogenous, which suggest pollution with fecal matter, or the existence of inorganic substances, such as lead, which may produce serious toxic conditions in those using the water for drinking purposes. The latter condition is rarely found except where lead piping is extensively used as a water carrier. Although the bacteriological tests of water furnish the most reliable index of the water's freedom from pollution, the chemical tests for organic nitrogen are often necessary because the bacterial indications of pollution may be temporary and intermittent.

The bacteriological test of water consists in a determination of the number of colon bacilli in one cubic centimeter of the water. The colon bacillus is a normal inhabitant of the intestinal tract of human and other warm blooded animals, and the finding of this bacillus in water indicates its pollution with human or animal excreta. It is highly desirable, of course, that all drinking water be free from this evidence of pollution, but it is practically impossible to enforce such a standard. Even where the most efficient system is used for rendering polluted waters safe for drinking purposes, it is impossible, constantly and completely, to eliminate colon bacilli.

Since 1914, the treasury department of the United States has prescribed certain sanitary standards of water as supplied by common carriers in interstate commerce. In 1922, a committee composed of sanitarians, representing federal and state health officials and others, was appointed by the surgeon general to recommend standards which could be applied to all classes of water supplies coming within the jurisdiction of the interstate quarantine regulations of the United States. The report of this advisory committee on official water standards furnishes a basis for municipal health laboratory examination of water supplies and municipal

health department procedure in guaranteeing water safety.[1] These standards are revised from time to time.

If the public water supplies are under municipal or private management, which maintain satisfactory laboratory services of their own for the testing of water supplies as routine, it may not be necessary for the health laboratory to make routine water tests. It is desirable, however, that the health laboratory make control tests from time to time which may be compared with those made by other agencies. If the municipal water department or private water company does not provide satisfactory tests of water under its own auspices, the health laboratory should make routine tests of the supply, preferably daily. In all cases where private wells or springs are used, the health authority should provide for their frequent testing at the health laboratory, and their prompt closure to use when their safety cannot be guaranteed. In any case, whatever the agency, public or private, in charge of the water distributing system, it is a responsibility of the health department to exercise sanitary supervision of the water, and if there is any doubt of the safety of the supply, it should omit no act necessary for public protection.

The Laboratory in Milk Sanitation

The laboratory examination of milk samples has two chief purposes. The first is to determine the bacterial content of the milk per cubic centimeter as evidence of its safety for human use; the second is to determine its chemical constituency in order to guarantee its nutritive value and freedom from adulteration. Both of these determinations, the bacteriological and chemical, are necessary for enforcing milk standards or grades, but the bacteriological tests are the more significant from the public health point of view. To be of value in the sanitary control of milk supplies, bacteriological tests must be made of each supply frequently, and at various points in its progress from the producer to the consumer. Routine tests of chemical constituents, such as butter fat and total solids, can be readily made by laboratory helpers who have been properly trained in the use of the mechanical equipment for making such tests. When it comes to the bacteriological tests of milk, no one except experienced bacteriologists, or expert technicians under their personal supervision, should be employed.

[1] "Report of Advisory Committee on Official Water Standards," *Public Health Reports,* April 10, 1925.

Occasionally, special examinations of milk are necessary to determine the specific character of bacteria in milk. The bacteria counts, which are made as a matter of routine, give only the total number of bacteria per cubic centimeter of the milk; they do not give evidence of the kinds of bacteria included in the total. The latter examinations are, however, extremely difficult to make, and are not attempted except in the health laboratories of large cities, where special research equipment and personnel are provided. The facts about the contamination of milk by special disease causing organisms, are more easily determined through epidemiological investigations of milk production and handling by medical, veterinary, and sanitary inspection of persons, cattle, and other factors concerned.

The value of the health laboratory in sanitary control of milk supplies, assuming the technical competency of laboratory workers, depends largely upon the number of samples of the various milk sources examined, or rather upon the frequency of examination of each source of supply. It is apparent that if bacteriological tests of a given supply are only made occasionally, say at intervals of a month, dangerous contamination may occur without any one being aware of it. The frequency with which tests should be made of each source of supply will naturally be governed somewhat by the evidence furnished by milk inspections with respect to the sanitary conditions of milk production and handling, but since the bacteriological testing of milk furnishes the only positive evidence of its safety, the more tests of each supply the better. For the purpose of determining milk grades, the commission on milk standards, previously cited in our discussion of milk regulations, recommends that there should be, at least, five bacterial counts of each supply taken over a period of not less than one week nor more than one month, and that four out of five of these counts should fall below the limit or standard of the grade in which classification is desired. More frequent tests are however, desirable.

For bacterial counts of milk, the standard methods recommended by the laboratory section of the American Public Health Association should be used by municipal health laboratories. The methods of making routine tests for butter fats and solids are standardized in practice through the general use of certain special apparatus. The percentage of butter fat in milk is determined by the use of the Babcock apparatus which centrifugalizes the milk after the separation of the fat by addition of sulphuric acid, thus causing

the fat to rise in a graduated flask from which the percentage of fat may be read off. The total solids are usually determined by use of a formula which can be quickly and simply applied to milk of a known percentage of butter fat, specific gravity, and temperature. This is the simplest and quickest method, and the results obtained by it agree well with those obtained through the more tedious procedure of evaporating the water from the milk and weighing the residue of total solids.

In our discussion of methods of milk sanitation, the use of sediment testing as a practical means of indicating the gross amount of dirt in milk was commented upon. Such tests, if considered useful in the education of dairymen, or in indicating the necessity for more adequate attention to the elimination of gross dirt from milk, would be done in the health laboratory, but they should be regarded as merely subsidiary to the more scientific determination of bacteria content per cubic centimeter. If personnel and equipment for making the latter tests are not provided, the health department may well make the sediment tests as a matter of routine, if for no other purpose than that of furnishing evidence to support a request for the needed laboratory facilities.

Laboratory Tests of Other Foods

Bacteriological and chemical examinations of foods, other than milk, are not often made as routine by the health laboratory. If the evidence of food contamination or adulteration cannot be obtained by field inspectors, and there is suspicion that the law is being violated, it is sometimes necessary for the laboratory to furnish the desired evidence. The inspection of cattle at slaughter is usually sufficient to detect disease infection of meat and the laboratory would be called in only when there is a question as to the accuracy of the inspectors' findings and the propriety of their action in condemnation or otherwise. In the case of meat products, which are sometimes dangerously contaminated through insanitary practices in manufacture, the laboratory may be called upon either as the result of the complaint of a citizen that sickness had been caused by eating the product, or as the result of a report by a food inspector indicating probable contamination. Examination of other foods and beverages are not often made except to satisfy complaints of citizens or in cases where the food inspectors suspect that bad food is being sold. Food intoxications of one kind or another are not uncommon, and in certain instances it may be

necessary for the health laboratory to carry on a series of examinations of special foods which are under suspicion as having caused sickness. As a rule, however, sickness of this type does not come to the notice of the health authority, except when there are large numbers of persons affected. In many of the largest cities, where the opportunities for food contamination are greatest and, at the same time, less readily detected by field inspections, laboratory examinations of foods and beverages, other than milk, may necessarily constitute a considerable part of laboratory routine for the enforcement of food regulatory laws. It is doubtful, however, if such examinations have any great value in preventing sickness among the people generally, because it is practically impossible to protect the consumer at all points in the food distribution system. Besides, most of the commercial adulterations of food, other than milk, are not dangerous to health, except through depreciation of their nutritional value.

Health Laboratory Research

Municipal health laboratories do not, as a rule, engage in laboratory research, except as this may be necessary for the solution of some particularly vexing administrative health problem of major importance. Such work is usually left to state health laboratories or to special research laboratories of hospitals and medical schools. It is desirable, however, that the municipal laboratory be so manned and equipped that its staff will have some time and opportunity for special research in their respective fields. Otherwise, it is extremely difficult to retain the most competent professional laboratory workers in municipal service. On the other hand, unless the research work carried on produces information which can be utilized for the benefit of the community which the laboratory serves, and which pays the cost of the service, citizens may have legitimate reason to protest. In the largest cities, such as New York, Chicago, Detroit, Cleveland, and Boston, many valuable special research studies have been made which have proved of immense value, not only to the communities concerned, but to the world at large. In such cities, laboratory research can often be conducted more satisfactorily by local health departments than by state health departments, because the former are in more direct touch with the problems to be studied, and more intimately concerned with the application of research findings. In the smaller communities, it is difficult to secure sufficient funds even to carry on the necessary

routine laboratory work, and until that has been done which essential to the day in and day out protection off the community against known communicable disease dangers, the health laboratory is hardly justified in undertaking special research activities whose value to the particular community may not be commensurate with their cost.

Health Laboratory Organization and Personnel

In the largest cities health laboratories are maintained as special units of the health departments or bureaus, but other types of organization are frequently found satisfactory. The municipal government may rely upon the services of a state or county health laboratory, or it may utilize the laboratory facilities of another adjacent city on a fee basis. It may coöperate with other nearby communities in the joint operation and control of a single health laboratory which serves them all, or it may provide for the special needs of the health department through an existing hospital or medical school laboratory. It may maintain a general municipal laboratory for service to all municipal departments, including the health department, or it may contract with a private individual or commercial laboratory for such special services as the health department may need.

In some states, strategically located cities may have no difficulty in obtaining the needed laboratory service through a state laboratory, but, as a rule, this results in delays which hamper prompt local control of communicable diseases, and does not permit as frequent laboratory examinations as are desirable for good health control. To meet this difficulty, branch state laboratories have been established in certain states which can be utilized to better advantage by local communities. In other states, county laboratories have been developed through special enabling acts, which give county authorities the right to establish and maintain health laboratories under their own auspices. This plan works very well in serving small local communities unable to maintain their own laboratories.

Where two or more cities are in close proximity, the establishment of a jointly maintained health laboratory has sometimes been found to work well. A better laboratory organization can be developed through such coöperative action than any one of the communities could provide of itself, except at a cost which might be prohibitive. As an alternative to this plan, a city having a well

organized laboratory may furnish laboratory service to adjacent communities at fees which cover the cost of the additional personnel, equipment, and supplies needed to provide it.

Where there are several departments of the city government, which need laboratory service of one kind or another, the city may find it practicable to maintain a general municipal laboratory under a single director. The work required by the health department, under such circumstances, is usually assigned to a special health division of the general laboratory and carried on by technicians having no other duties to perform. There is no special objection to this type of organization, except that it sometimes happens that the importance of work which requires the most prompt attention may be minimized because of other laboratory work which appears to be more vitally necessary at the moment. Since the general equipment for all municipal laboratory uses is substantially the same, it is perhaps more economical to have it all centered in one place and under one direction. Economy in laboratory operation under this plan is real, only if the health department's need for prompt and efficient service is adequately met. The most costly thing to any community is failure to meet disease dangers at the moment of their discovery.

If the city has a municipal hospital or a medical school which maintains good laboratory facilities, it may be desirable for the health department to utilize them. Here again, however, there is likely to be an overemphasis of the particular laboratory needs of the hospital or medical school at the expense of the health department's necessary routine work. As in the case of the general municipal laboratory, the desire for economy in laboratory operation and maintenance, through consolidation of laboratory services in this way, may result in no economy whatever, if the health department's work is not given the attention which it deserves.

Contracts for laboratory service entered into with private individuals by the city are rarely satisfactory, although sometimes necessary for small cities, where none of the other plans described can be adopted. There is always a danger where the health laboratory work is done by private agencies or individuals, that commercial interests may bring influence to bear upon the laboratory findings to the public detriment. Where large sums of money may be lost or gained to certain individuals or concerns, through the enforcement of necessary health control measures, it is easy

to understand how the public interests might suffer at the hands of a private commercial laboratory.

All things considered, there is no plan of health laboratory organization which satisfies the needs of the average health department quite as well as the maintenance of the laboratory at the health department, or in close physical proximity to it, and under its exclusive management and control. Where this is done the health officer is able to keep his finger on the laboratory pulse at all times, and to direct the carrying out of such procedures as he may deem necessary, with the least possible delay, and with the best adaptation to the needs of the moment. If the laboratory is situated where frequent contact between its technical experts, the health officer, and field nurses and inspectors is made easy, there is a decided gain in team work for disease prevention. The laboratory so situated can also be of high educational value not alone to the health department personnel, but also to physicians and others who come to the health department for various purposes. If the laboratory is conducted as it should be, and physicians who come to the department are given every possible opportunity to observe its operations, and even to help in its work, if they are especially interested, the usefulness of the laboratory to the community will be considerably enhanced.

The personnel of the health laboratory will naturally depend somewhat upon whether the laboratory is a unit of the health organization and under the exclusive direction and control of the health department, or is otherwise organized according to one or another of the plans which have been described. Assuming that the former is the case, the laboratory is commonly designated as a bureau or division of the health department, with a director at its head, and coördinate in rank with other bureau or division units. Since the bulk of the laboratory work will be in connection with the making of diagnostic tests for disease, the director should be a bacteriologist. In the average small city, in the neighborhood of 50,000 population, it would probably be sufficient to have one competent bacteriologist on part time for special diagnostic examinations, and one technician under his supervision for routine chemical examinations of milk and such other examinations as do not require the personal attention of the bacteriologist. Competent observers consider that under normal circumstances a health laboratory should perform approximately 125 examinations of all kinds per 1,000 population. This would mean about 7,250 such examina-

tions in the city of 50,000 population, or approximately 25 per day, assuming 300 working days per year. This would be about all that the personnel above suggested could do, considering the great variety of other work incidental to laboratory routine and making due allowance for emergency requirements.

In determining the increase of a laboratory staff necessary to provide the service required in larger cities, factors of special local significance must be taken into account. For practical purposes, we may consider that the amount of diagnostic work will increase in direct proportion to the increase of population. In the larger cities, however, there is likely to be a much greater demand upon the health laboratory for other work than might be indicated by population alone. For example, in a large city where it is difficult to provide satisfactory control of the milk supply through field inspection of dairies, it may be necessary to secure the desired evidence regarding their condition through a much more extensive use of the bacteriological tests of milk at all points in the milk chain than might be necessary elsewhere. In the larger city, where opportunity for other food adulteration and contamination is also greater because of the greater complexity of the food distribution system, more laboratory examinations of foods generally will probably be required. If health examinations of food handlers are required, the laboratory will be called upon for special diagnostic work in connection with such examinations. If industrial health hazards are serious, it may be necessary for the laboratory to make a great many tests to determine the nature of the dangers existing in various industrial processes. All of these factors must be carefully weighed and evaluated. The figures previously cited as representing the average routine demand upon the health laboratory would of course need adjustment to meet such special situations as have been described.

Practical Tests of Laboratory Efficiency

A precise estimate of the efficiency of the health laboratory cannot be made except by the scientifically trained expert who is capable of making an appraisal of all technical laboratory procedures. There are, however, certain practical tests which may be made by any one ordinarily familiar with laboratory needs and aims. In preceding paragraphs, we have suggested how a good health laboratory should serve the health department, as well as the physicians of the community, and have indicated in a general

way the standards which should be met in laboratory operation. Having in mind, then, the primary purpose of the laboratory to furnish evidence on which prompt and proper action may be taken by the health authority, the practical tests of its service may be recapitulated in question form as follows:

1. Is the laboratory personnel adequate to perform the volume of work which ought to be done, and are the professional and technical qualifications of workers such as to bespeak confidence in their findings?

2. Do the procedures followed conform generally to the standards recommended by authoritative bodies, such as the advisory committee on official water standards, and the laboratory section of the American Public Health Association?

3. Is the laboratory so housed and equipped as to promote best utilization of its services by the health department and by the physicians of the community, and conserve the time and energy of laboratory workers?

4. Does the volume of the work performed by the laboratory in routine examinations of all kinds conform to recognized standards of what a laboratory should be prepared to do in the given community?

5. Is opportunity given laboratory personnel to engage in special research work of value in the betterment of health administration?

6. Is the record keeping system so organized as to permit clear interpretation of work done and results obtained, and adapted to the needs of the laboratory, the health authority, and physicians?

7. What is the cost of laboratory service, and what is the relation of this cost to the volume and character of work performed and to the total expenditure for all health purposes?

It is apparent from a review of the foregoing questions that the answer to each is, to a considerable degree, dependent upon the answers to all others. The adequacy in number of the staff can only be determined by careful estimate of the volume of work that should be performed, the technical qualifications of workers, the standards of technical procedure maintained, and the facilities of plant and equipment available. The cost of laboratory service is chiefly determined by the numbers of employees and the salaries paid. Scientifically trained men must be paid more than unskilled workers. The volume of work done by trained workers is likely to be greater than that done by untrained workers, and cost may, therefore, have a direct bearing upon work volume.

Laboratory Personnel and Equipment

If the professional and technical staff is made up of scientifically trained and experienced workers, the maintenance of recognized standards of technical procedure will follow as a matter of course. Essentially the same procedures in routine laboratory examinations are carried out by all trained bacteriologists, pathologists, and chemists. If the laboratory workers are not selected with their scientific qualifications in mind, it is almost certain that such standards will not be maintained. It should not be necessary to say that untrained persons should not be employed in laboratory work which calls for the highest type of skill and professional judgment. The consequences of inaccurate diagnosis of disease and inaccurate determinations of the cleanliness and quality of water, milk, and other foods cannot be lightly dismissed. The lack of confidence in laboratory reports which such inaccurate determinations would induce might seriously disrupt the whole health program. Yet, it is not uncommon to find laboratory examinations of all kinds being made by untrained persons, simply because funds have not been made available to pay the salaries demanded by trained workers. Under such circumstances, it is usual to find that laboratory use by physician falls far below that desirable. This means, of course, a loss in communicable disease control.

Good laboratory work requires good quarters and good equipment. If the laboratory is so situated that its contact with the general work of the department is made difficult, this is likely to be handicapping to the laboratory itself, and to the other units of the department organization. Good lighting and good ventilation, proper facilities for cleanliness and personal hygiene of workers, and opportunity for uninterrupted work are essential to maximum efficiency of personnel. The technical equipment for laboratory work should be carefully selected and conveniently arranged so as to conserve the time and energy of employees. A day's observation of routine laboratory operation is usually sufficient to indicate to almost any intelligent observer where time is lost and energy dissipated through faulty arrangement of equipment. The essential items of technical equipment can be obtained at relatively small cost, and laboratory equipment manufacturers are prepared to give expert advice in its installation for most economic and efficient use.

Quantity of Laboratory Work Done and Its Significance

The volume of work done, particularly in the diagnosis of disease, reflects not only the efficiency of the laboratory itself, but also, in a measure, the adequacy of the general program of disease prevention and control. Knowing the average requirements of cities for diagnostic tests for communicable diseases, one may determine fairly well, from the number of the various diagnostic tests made, whether or not the laboratory is functioning below or above normal. A fairly good check upon the volume of diagnostic laboratory work, which ought to be performed for certain diseases, may be obtained from the records of cases of these diseases reported to the health department. If, for example, the disease register showed that, although there were fifty cases of typhoid fever reported to the department, only ten laboratory examinations for typhoid fever were made, it would be presumptive evidence that physicians were not making sufficient use of the laboratory for typhoid fever diagnosis. In such a situation, the fact that physicians were not depending on the laboratory for diagnosis in typhoid fever would lead to the belief that there were probably some cases of the disease which were not identified early enough to permit the health department to exercise proper precautions against the spread of the disease. If there were 200 cases of diphtheria reported to the department, and the laboratory records showed only 100 examinations of diphtheria cultures, it would be presumptive evidence not only that the laboratory was not being used to best advantage by physicians, but also that the control exercised by the health department in diphtheria cases was not adequate. Control of diphtheria requires that before a patient shall be released from health department supervision, at least two successive examinations be made of the secretions from the nose or throat. Considering that one examination were necessary for diagnostic purposes, and at least two for determining the propriety of release from departmental control, 200 cases of diphtheria would require about 600 laboratory examinations. In certain instances, diagnostic lists for diphtheria might be made in other laboratories, and would not, therefore, appear in the records of the health laboratory. Tests made to determine the freedom of the patient from infection, and his final release from supervision should, in all cases, be made in the official health laboratory, except when the patient is in a hospital having a labora-

tory whose reports are acceptable to the health department. The laboratory records should, therefore, show the result of examinations for release in all except hospital cases.

Research work, as we have already said, cannot ordinarily be carried on in the health laboratories of small cities, owing to the increased cost burden which this work puts upon laboratory operation and maintenace. If special research is carried on, there should, however, be a complete record of what was done, what it cost, and what it produced of practical value for health administrative purposes. Expenditure of public funds for laboratory research cannot be readily justified except through such records. In an appraisal of laboratory efficiency, review of recorded data on research projects must, therefore, be made. In not a few health laboratories, research projects are undertaken, carried on for a time and then dropped before concluded, either because of lack of funds, or other reason less obvious, without anything but the most casual memoranda of procedure and findings. This represents, in many instances, a waste of public funds, and a loss in laboratory efficiency.

Laboratory Record Keeping

The general record keeping system of the laboratory should be designed to serve the following purposes:

1. As a source of reference and information for laboratory workers, the health officer or other health officials concerned, and the physicians of the community.

2. As an evidence of the use for laboratory purposes to which public funds have been put.

To serve these purposes adequately, complete records should be kept of all examinations made by the laboratory, and of all facts needed by those concerned in the utilization of laboratory findings. Book registers, card indices, or both, may be used for this purpose. The record should show, with respect to each specimen examined by the laboratory, the date of its receipt and examination, the person from whom received, the nature of the specimen, from what patient or other source the specimen was taken, and for what purpose, the character of the examination made, the findings of the laboratory, the name of the person making the examination, the date of examination, the name of the person to whom report was referred, and the date of its reference. If there were any special circumstances in the taking of the speci-

men or in its examination, which might influence the laboratory findings or the use of the laboratory's report, these should be noted.

Records of laboratory work should be so kept that they may be readily summarized for any given period. Such summaries should show the nature and number of the various examinations made, and, with respect to diagnostic tests for communicable diseases particularly, whether the examination was "positive" or "negative," that is, whether or not evidence of disease was found. The classification of specimens according to their nature should be sufficiently detailed so that it will be possible to determine how many examinations were made for each disease entity as typhoid fever, pulmonary tuberculosis, diphtheria, malaria, or other infection. The summary of milk examinations should show how many were examined for bacterial content, how many for chemical constituency, how many for special adulterants, and what the findings were, particularly with respect to those samples found not to conform to legal standards. Other tests, bacteriological and chemical, should be summarized according to character, purpose, and findings, in as much detail as is necessary to proper understanding of laboratory operation.

From such summary reports, the examiner knowing the cost of laboratory operation and maintenance for the given period may determine, with some degree of accuracy, whether the volume of work done was all that should be expected, and whether or not the utilization of the laboratory for health protective purposes was sufficient to justify the cost.

Laboratory Costs

The cost of health laboratory service naturally shows great variation in different communities, depending upon the size of population and consequent greater service demand, the efficiency of personnel and the salaries paid, the character of the laboratory plant and its equipment, the nature and extent of special research carried on, and a great variety of other facts of varying weights, many of which are peculiar to local community conditions, or to peculiar requirements of the local health authority. Other things being equal, and assuming that the laboratory is doing all that might be expected of it, that is, about 125 routine examinations of all kinds per 1,000 population, it is estimated that the cost per examination of all kinds should be somewhere in the neighborhood of forty cents. Cost per examination is determined by dividing

the total cost of laboratory operation and maintenance by the total examinations made. If the cost per examination is found to be far above or far below this figure, careful inquiry should be made on all points suggested in the summary of test questions, and with due regard to other factors which are apparently of influence in the particular situation.

The cost per capita for laboratory service, which is obtained by dividing the total cost of laboratory operation and maintenance by the total population served, ordinarily ranges from two to four cents, as low as one cent or less in a few cities, and as high as ten cents in a few others. From such evidence as is available, it seems fair to say that a laboratory service adequate to meet the requirements of cities of 50,000 population or more cannot be maintained, under the exclusive direction and control of the health department, at less than five or six cents per capita. This would mean in a city of 50,000 population an expenditure of from $2,500 to $3,000. As a check on the value of this cost figure, let us assume that the health laboratory in the city of 50,000 population is expected to perform 125 examinations of all kinds per 1,000 population, and that the expected unit cost per examination is forty cents. The total cost as estimated in this way is 125 x 50 x $.40 or $2,500, which agrees fairly well with the estimate of five to six cents per capita.

In the majority of cities, expenditures for health laboratory service represents from 5 to 7 per cent of the total expenditure for health department purposes, exclusive of amounts spent for hospitals under health department administration. This does not mean that such a budget allotment for laboratory purposes is a proper guide for determining what ought to be spent, for there are relatively few cities in which health laboratory service has been given its proper place in the health program. It may well be doubted that our city of 50,000 population with a per capita expenditure for all public health purposes of fifty cents or $25,000 could obtain adequate laboratory service of the desired volume for even 7 per cent of this sum, or $1,750, although $25,000 might be otherwise a reasonable allotment for general health purposes in this city. The method of estimating the cost of laboratory service on the basis of quantity of work to be done, as described in the preceding paragraph, is more accurate.

This raises the question of relative values in health expenditure, which we shall discuss more fully in a later chapter. The fact is

that the value of health laboratory service is generally underestimated in planning municipal expenditures for public health. All too often, the laboratory is forced to take an insignificant place in the health program, chiefly because there is little in laboratory service which appeals to public interest or to partisan politicians. A request for an increase of several thousand dollars for the employment of more inspectors finds a great deal less opposition than a request for a thousand dollars to better laboratory facilities.

Illustrations of Defects in Laboratoy Organization and Use

The following descriptions of health laboratories in two large cities illustrate well several of the handicaps to good laboratory organization and use which have been suggested in the preceding section:

The present organization and salary cost of the laboratory, exclusive of the services of a milk inspector assigned to routine chemical tests of milk, is as follows:

Director of laboratory	$3,000
Chemist	1,000
Laboratory aid	600
Stenographer	700
Total	$5,300

The director is charged with the complete supervision of all laboratory work, the certification of reports of analysis, and the preparation of reports to the medical officer of health and other municipal officers for whom analyses are made. He is required to attend court to testify as to findings of laboratory examinations when the prosecution of violators of the law so requires.

The director is a graduate of medicine and pharmacy, and holds the degree of doctor of public health from McGill and Laval universities. He had had considerable experience in bacteriology and chemistry as a university instructor, and also in the municipal laboratory with which he has been connected since its beginning. From the standpoint of experience and training, this officer should be fully competent. It should be pointed out, however, that a director on salary of $3,000 a year should devote his entire time to his duties and should not be permitted to practice privately. Furthermore, he should be required to be in daily attendance at the laboratory during the office hours of the department of health. There is little at the present time for a director to do, but as the work of the laboratory is increased, as it

should be, the director should be required to bear his share of the routine work of the laboratory either as chemist or bacteriologist.

The chemist is required to make practically all routine laboratory examinations, both bacteriological and chemical, prepare media, supervise the making of chemical analyses of milk samples as they are done by one of the milk inspectors and perform such other duties as the head of the laboratory may direct. He is a graduate pharmacist, but has had no special training in bacteriological and chemical work, except that which has been gained by several years' experience of laboratory work. It is believed that he is competent to do much of the routine work required, but because he has not had professional training, full confidence in his reports on diagnosis of disease is lacking among physicians.

The laboratory aid assist in the preparation of media, in the cleaning of the laboratory equipment, and in such other minor laboratory work as may be necessary. He is not competent to do any work which demands professional or technical training, and on that account the value of his services is limited though necessary.

The stenographer performs the necessary stenographic work of the laboratory in the preparation of reports and correspondence of the director, receives and records the samples sent to the laboratory and transmits the reports of examinations to physicians and others concerned. Lack of experience of this employee in clerical work is responsible for unsatisfactory records.

The following summary shows the work accomplished by the laboratory in 1916:

Kinds of Examinations		*Number of Examinations*
Analysis of milk		
Bacteriological	865	
Chemical	2,722	
		3,587
Sputum		471
Urine		540
Diphtheria cultures		158
Pus		123
Blood		58
Quantitative analyses (miscellaneous)		1,523
Preparation of cultures		662
Other tests (drugs, oils, explosives, etc.)		196
		7,318

It will be seen from the preceding summary of work performed by the laboratory, in 1916, that its service in the control of preventable

diseases was of relatively little value. There were only 158 examinations of diphtheria cultures, although there were 372 out of the total of 1,197 diphtheria cases which were not removed to hospitals. Proper diagnosis of diphtheria requires, in the majority of cases, at least one examination of a culture from the nose or throat of the patient. Termination of isolation should be granted only upon proof by two successive cultures from the nose or throat, taken twenty-four hours apart, that the patient is free from the disease. If the patient is treated in a hospital, these latter tests may be made in the hospital; otherwise, they should be made by the health department laboratory. It is obvious, therefore, that for diagnosis and adequate control of diphtheria, there should have been several times as many examinations of diphtheria cultures as were reported by the laboratory.

In other work also, the laboratory examinations fall far below what might be expected in a city of Montreal's size. Examinations of milk for bacterial counts were too few to be of great value in determining the cleanliness of the milk supply. Examinations of blood, chiefly from typhoid patients were too few to be of great value either in identifying cases or in control. Examinations of urine, except in the diagnosis of typhoid infection, though perhaps justifiable on other grounds, are not of great significance, since as far as other communicable diseases are concerned, these examinations have little bearing upon health department action.

The laboratory service to physicians should be greatly extended. Physicians should be informed of the service which the laboratory offers and they should be urged to make use of it. If all physicians attending cases of diphtheria or suspected cases of diphtheria would send cultures to the laboratory, the department would have in its laboratory records, an excellent registration of cases which could be used to check the declarations required by law. The same holds true with regard to cases of tuberculosis and typhoid fever, the precise diagnosis of which is made possible through laboratory tests. In cases of venereal disease also, a beginning of registration can be made if the laboratory will provide for the diagnostic tests for syphilis and other venereal disease.

In order to secure the coöperation of physicians in improving laboratory service it should be made easy for them to take specimens for laboratory examinations and easy also for them to transport these to the laboratory. At present, they must bring their specimens to the laboratory. Boxes have been provided for placing in police stations, such boxes to contain complete outfits for the taking of diagnostic samples. Unfortunately, these boxes have not been outfitted and put into service. It is recommended that this be done as soon as possible. Physicians may then secure their outfits at the nearest police station and place the samples taken in the boxes whence

they may be collected each day by policemen or sanitary inspectors, and brought to the laboratory for examination. Such a provision would unquestionably result in wider use of the laboratory.

All improvements in laboratory procedure will avail nothing, however, if physicians do not have confidence in the laboratory and its work. There must be, therefore, such changes in personnel as will guarantee the confidence of physicians in laboratory findings.

It is the practice at present for one of the milk inspectors to make the chemical examinations of milk to determine butter fat and solids. This is a simple procedure which an inspector can perhaps do satisfactorily, but the analyses of milk samples should be kept entirely separate from any connection with the milk inspection division. Although these samples come to the laboratory designated only by number, it is not at all difficult for the inspector to find out just what concerns are interested in the samples. There is no evidence of improper practice on the part of the milk inspector, but the possibility of such improper practice cannot be denied. Under the reorganized laboratory service these tests should be done by a laboratory employee.

The force needed to do the work required by the hygiene department should comprise a chief bacteriologist or director, with experience and training in all lines of bacteriological examination and research, a bacteriologist who may devote his attention exclusively to milk bacteriological work, a chemist, who may perform all necessary chemical examinations of food, drugs, milk, etc., a laboratory helper who may assist in routine bacteriological and chemical work, and a laboratory cleaner.

If the laboratory assumes the responsibility of making chemical and physical tests for other city departments, an industrial chemist should be employed for this work.

The following summary shows the probable cost of laboratory service under this plan of organization.

Chief bacteriologist	not to exceed	$3,000
Bacteriologist	not to exceed	1,800
Chemist (industrial)	not to exceed	1,500
Chemist	not to exceed	1,200
Laboratory helper	not to exceed	900
Laboratory cleaner	not to exceed	600
		$9,000

This means an increased cost for laboratory service of $4,400, exclusive of the salary of the stenographer who should be transferred to the proposed central stenographic office. The increase in cost is,

however, more than offset by the value of the improved service which will be given.[2]

There are two laboratories in the bureau of health. The city chemist is provided with a laboratory in the building occupied by the dispensary, while the bacteriological laboratory is in the city hall. The city chemist receives a salary of $1,500 per year, and his chief function is to make chemical and physical analyses of materials and supplies purchased by the city. Because the city bacteriologist holds that his function is merely to make examinations for diphtheria, all other bacteriological work has been delegated to the city chemist, who is not prepared in equipment or by training to do much of the work which he is called upon to do, and which is entirely outside of the field of a city chemist.

The city chemist's laboratory is poorly equipped because, as he states, no money has been allowed him for equipment. He has been obliged to build his own cabinets and shelves, and to do what painting was necessary to make his laboratory presentable.

As stated, the bacteriological laboratory holds that its sole function is to perform examinations of diphtheria cultures and in the report for 1913 this statement is found: "Examination of cultures for diphtheria bacilli is the only free bacteriological work done by the city and in that respect Denver is somewhat behind some of her sister cities which have free examinations of sputum for tuberculosis, Widal tests for typhoid fever, examinations for rabies, etc." All this is unfortunately too true. The bacteriological laboratory is doing very little for the money which is spent on it.

The bacteriologist receives $1,860 per year for an unknown amount of time, the assistant bacteriologist, $1,260 per year, also for part time service, and a second assistant bacteriologist, who is in reality merely a laboratory helper without technical training, receives $1,200 per year, an unnecessarily high salary for this kind of work. The records of this laboratory show that in 1913, 7,227 diphtheria cultures were made and examined. This means that in a year of 300 working days, on an average, twenty-four examinations per day were made. For this service, the salaries amounted to $4,320 which compared with the cost of bacteriological work in other cities, represents a high salary cost for a relatively small volume of work.

Although it was intended that the city chemist should be of service to the commissioner of supplies, in making physical and chemical tests of materials purchased by the city, he has done very little work

[2] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Montreal, Canada,* 1917 (typewritten), pp. 1335-1339, 1342.

of this kind. He states that whenever he has obtained materials for examination, it has been necessary for him to go out and get them himself, and that only rarely have materials been sent to him by city departments. The record of work performed by the city chemist bears on this statement. From January 1, to April 15, 1914, the following samples of foods and supplies were examined by the city chemist:

Milk	130
Cream	3
Wine	49
Butter	3
Ice Cream	1
Other foods	43
Drugs	2
Preservatives	3
Water	8
Asphalt	2
Oil	5
Gravel	5
Gasoline	18
Ink	1
Sputum	47
Total	320

Although this record of only 320 examinations in three and one half months cannot be commended, the city chemist should not be too severely criticized on this account, for as previously stated, he has been obliged to be his own carpenter, painter, collector of samples, and bottle washer. In addition to the above examinations, the city chemist made forty-seven bacteriological examinations of sputum for the dispensary and, in the examination of 130 samples of milk, he made eighty-five bacteriological determinations. None of this bacteriological work should have been done by the city chemist, but it was done by him because the bacteriological laboratory did not or would not accept it. To do this work, which required special training and technique, the city chemist was obliged to learn by experience and by private study. He should be commended for his efforts under such handicaps.

The city chemical laboratory is a very important factor in city service. All goods purchased by the city should be examined by the city chemist before payment is made, to see that definite standards of quality are maintained. If this laboratory is made use of as it should be, thousands of dollars may be saved yearly by the city in the purchase of supplies.

There is no apparent reason why two separate laboratories with two sets of equipment should be maintained. The room now used by the city chemist (if no better space can be found), should be overhauled and put in first class condition, and the bacteriological and chemical laboratories combined under one director in this room. The room now occupied by the city chemist is suggested for this purpose because it is next door to the city dispensary, from which many bacteriological samples are received.

The registration and control of diphtheria, typhoid fever, tuberculosis, ophthalmia neonatorum, venereal diseases, and many other communicable diseases under departmental supervision are greatly improved through free laboratory service to physicians. A specimen of blood from a typhoid patient means that the bureau has a record of that case; a sample of sputum from a case of tuberculosis means registration of the case. The coöperation of physicians in reporting diseases is much more readily secured when facilities for laboratory service are furnished them free.

For the combined bacteriological and chemical laboratory service, the following staff is recommended:

Full time bacteriologist	$2,400
Full time city chemist	1,500
Laboratory helpers (2 at $900)	1,800
Total cost	$5,700

Present part time service in the bacteriological laboratory costs $4,320, and the salary of $1,500 paid the city chemist makes a total of $5,820, $120 more than the cost of the full time improved service recommended.

In the chemical and bacteriological laboratories as in other branches of health service, time records are needed. The health officer should know what he is getting for the money which is spent on these laboratories, and whether laboratory employees are giving at least a time equivalent for salaries received. At present he has no information whatever regarding the time spent in city service by two of the employees of the bacteriological laboratory.[3]

[3] New York Bureau of Municipal Research, *Report on a Survey of Certain Departments of the City and County of Denver, Colorado,* 1914 (printed), pp. 49-52.

CHAPTER XIV

PUBLIC HEALTH EDUCATION

The great progress which has been made in public health administration in the last half century, and particularly in the last two decades, is not to be credited solely to the great discoveries which have been made regarding diseases and its causes, and the public health legislation and regulation which has followed. Tuberculosis is fast being conquered, not primarily because new and improved laws for its prevention and control have been enforced, but because people have been taught how to live healthfully. The other great plague, syphilis, is coming under control, not alone because it is now officially recognized as a communicable disease, dangerous to public health, and therefore to be controlled by legally authorized measures, but because people are learning the truth about the hygiene of the sexual function. Infant mortality, which twenty years ago was appalling in almost all cities, has been cut in half, not because of the legal enactments for the protection of child health, but because mothers have been taught how to care for themselves and their babies.

It is fair to say that the health department which fails to keep its community fully informed about disease and how to avoid it, is not an efficient health department no matter how well organized and equipped it may be otherwise. In our best municipal health departments health education is strongly emphasized and in many of the larger cities special bureaus or divisions of health education have been established to utilize all possible means of health publicity. In the great majority of city health departments, however, health education is in a most rudimentary state.

It is unfortunate that public health officials generally have not capitalized the widespread public interest in health in the same way that it has been capitalized by the newspapers and magazines, the life insurance companies, manufacturers of sanitary supplies and equipment, patent medicine purveyors, quack "specialists" and propagandists of one kind or another, good and bad. The

opportunities for municipal health authorities in this field were never greater but relatively few have taken full advantage of them. That the false propagandists of drug and other "cures," the so-called "specialists" in the treatment of disease who prey upon public credulity, the antivaccinationists and others of that ilk have prospered is ample evidence of the failure of real health educational work. There is much to be done by legal enactments to eliminate some of these serious barriers to true community health education, but this can never be brought about until the public has been taught to distinguish between the true and the false health prophets. When they are able to do so, it is likely that legal repression of false propaganda will present fewer difficulties. But progress in this direction is slow largely because municipal health departments are so often poorly financed for health educational work, and also because so few even of our most able health executives are good teachers. It is not enough merely to tell the facts about health. They must be put in such form that they will seize the public imagination. But it is extremely difficult to popularize scientific information so that it will appeal to the imagination of the lay reader and at the same time satisfy the legitimate demands of science for strict accuracy of statement. On the other hand, those false propagandists who have been most successful in capitalizing the general interest in health, are under no such limitations. Truth is not a necessary ingredient of their publicity, and pseudo science may be masqueraded as science in a great variety of the most attractive and entertaining disguises.

As able a health teacher as Dr. George W. Goler of Rochester, expresses his discontent with his own health educational efforts thus in his December, 1925, health bulletin:

> As far as we could within our power, we have taken the means of prevention to the people. We have preached it in the schools, written about it in the newspapers and pamphlets, published booklets by the tens of thousands and distributed them, and we have had demonstration stations in the schools, both for school children and for preschool children. We have advertised in the newspapers, and on some occasions, we have talked to groups of people about the desirability and their duty of having their children and themselves protected against diphtheria. We have, too, shown a moving picture of diphtheria to many thousands of people. Still 250 families have been invaded with this disease, and in some families the disease has been so serious that there have been fifty-two deaths.

But Dr. Goler does not present the other side of the picture, that is, what has actually been accomplished for health education in other lines as the result of the educational work described. In this particular city, Dr. Goler's health educational activities during the past twenty years and more have made his city a leader in community health enterprise in this country. This has come about not as the result of any special health educational "drive" or "campaign" but through the cumulative effect of Dr. Goler's year in, year out, patient health teaching. This is the only way in which real progress in community health education is made, not by occasional sporadic appeals to momentary community interest but by organized, systematic, persistent effort on the part of the health officer to inspire the public's confidence in himself and his message.

The Essentials of a Health Educational Program

Whether or not a city is large enough to justify the creation within its health bureau or department, of a special unit or division for health education under the direction of an expert in this kind of work, must be determined by circumstances. It may be said, however, that probably few cities under 100,000 population would require such special unit. In such cities and a few of larger size, it would be as well to have health educational activities under the personal supervision of the health officer himself, and carried on merely as one of his general administrative duties. But no matter what type of organization for health education is required, the essentials of the educational program are the same. These are briefly:

1. The public should be fully advised of the legal responsibilities of the health bureau or department and of its own obligations under the laws of federal, state, and local governments. This implies that a complete compilation of health laws, rules, and regulation, should be readily available for the information of public health employees and citizens generally.

2. The public should be kept informed by periodic reports and bulletins of the state of community health, and the organization, methods, results, and cost of official health service. The health authority should prepare and publish such periodic reports of health service as may be necessary to this end.

3. The public should be instructed in all matters of public and personal hygiene and sanitation as routine, and to meet emergency

situations, by health lectures, exhibits, moving pictures, news articles, special pamphlets, etc.

The Public Health Manual

In a study of municipal health administration, the first aim should be to discover whether or not the organization and procedure of the health department conform to existing legal requirements and are adapted to the enforcement of the laws provided. To discover these facts, state and local laws and the regulations supplementing them must be carefully examined and the effect and cost of their enforcement or nonenforcement upon community health appraised There are, however, comparatively few cities where such a review of state and local laws and regulations can be readily made, because they have not been brought together in an easily reviewable form. State health departments commonly publish the general health laws and regulations in pamphlet form, but these are not often kept currently to date. The examiner finds it necessary in many instances to resort to a copy of the codified state laws, if, happily, such codification has been made, or to the many volumes of the annual publications of the "session laws," to obtain information which should be more conveniently available. When it comes to review of local ordinances and regulations supplementary to state laws, one finds even greater difficulty. Many times it is necessary to depend for information upon the back numbers of the newspapers in which local ordinances or regulations were originally published. Even where the ordinances or regulations were published as special bulletins or pamphlets, the editions may have been exhausted and perhaps only one or two copies have been kept for official use. It is not at all unusual to find that not enough copies, either of the state or local health laws and regulations, are available even to meet the needs of the health officer and his staff. In more than one instance the writer has been unable to find complete copies of state and local health enactments in the offices of the health board or health officer, and where this situation exists it follows that there is almost inevitably ignorance on the part of some health officials and agents of the precise nature of their duties and responsibilities.

If the health department employee is handicapped by lack of a complete and up to date code or manual of health laws, ordinances, rules and regulations, what can be said of those engaged in private health work of various kinds, and citizens generally. One would

expect that the representatives of private health agencies would be thoroughly familiar with the mandatory or regulatory duties and responsibilities of the public health agency in order that they may plan their own work intelligently, but in many cases private health agencies are neither familiar with the public health laws nor with the health department's organization and methods for their enforcement. Citizens invariably reveal a most woeful ignorance of public health laws and regulations which deal most intimately with their personal and business relations to the community as a whole.

It is further evident that no one is competent to teach public health in any community who is not familiar with health laws and regulations and their practical application to that community. Physicians, nurses, school teachers, and others directly concerned in health teaching are rarely able to answer the frequent questions of their patients or pupils regarding health laws and regulations except in those few cities where special effort has been made by public health authorities to instruct them on the subject. In one large city of over 100,000 population, the author found a great deal of the health educational work being done by a private visiting nursing agency coöperating with the health department. Inquiry of the superintendent of agency and among the field nurses disclosed that not one of them knew what the health laws or regulations were regarding communicable diseases, and there was not among them a printed or written statement of what their duties were when communicable diseases were encountered. At the local health department office it was discovered that there was a single copy of a very much abbreviated outline of the state health department's regulations regarding communicable diseases but that none even of the employees concerned in the enforcement of these regulations possessed a copy of the regulations or had been instructed in the procedure necessary for their enforcement. In fact, all health employees disclaimed knowledge of any printed or otherwise reviewable publications on the subject of departmental regulations and procedure. It is not to be wondered at under these circumstances, that communicable disease control was ineffective.

Strictly speaking, a municipal sanitary code is merely the body of local health ordinances and regulations having the effect of law governing local health administration. That is to say, it would not necessarily include the basic health laws to which local ordi-

nances and regulations are complementary or supplementary. The sanitary code may be drafted as one ordinance covering all local health administrative concerns and so enacted by the local legislative body, or it may be merely a compilation of ordinances and regulations enacted at various times to meet special conditions. In a few states where effort has been made to develop uniformity of local health administration, the state departments of health have promulgated codes of regulations having the effect of law which are of general application to all health jurisdictions throughout the state. In such cases, the municipal sanitary code includes the state sanitary code plus such municipal health ordinances and local health regulations as may be provided, not inconsistent with the state code. The sanitary code of the New York state department of health is an illustration in point. Under the general public health law of the state, the public health council of the state may establish and from time to time amend sanitary regulations which shall have the force and effect of law and shall apply to and be effective in all portions of the state except New York City, unless otherwise stated. Each city, town, or village may, however, enact sanitary regulations not inconsistent with the state sanitary code. All local health officers have the power, and it is their duty to carry into effect in their respective jurisdictions the provisions of the public health law, the state sanitary code, and the orders and regulations of their respective boards of health, not inconsistent therewith.

To be of greatest educational value, health laws and regulations should be published in the form of a manual or handbook which may be widely distributed among public health employees, officials, and agents of other municipal departments, representatives of private health and welfare agencies, hospital authorities, physicians, nurses, teachers, and other persons whose coöperation for health service is needed. It is rarely possible, even when the state health authorities have prepared a manual of this kind, for local health authorities to obtain sufficient copies for general distribution. The cost to local communities of preparing and publishing such a manual for general distribution would, of course, be greater where previous compilations of health laws and regulations had not been made available by state health authorities, but in any case, the cost would be more than offset by the gain in public education and intelligent coöperation. Once prepared and published, such revisions and amendments as might be necessary

could be published annually, and given the same distribution as the manual. A complete revision and republication of the manual would probably not be necessary except at ten year intervals unless extensive and radical changes in state or local enactments warranted.

The Public Health Manual of the New York state department of health furnishes an excellent illustration of the form and content of such publications. This is a paper bound volume of handy size (5½"x8½"), having 221 pages. It contains:

1. General outline of the state health organization and a roster of officials with their addresses.
2. Table of contents.
3. The public health law of the state.
4. The sanitary code or code of general regulations promulgated by the state public health council.
5. Qualifications prescribed by the state public health council for local health officers, public health nurses and directors, and bacteriologists-in-charge of state-aided health laboratories of counties and cities.
6. Sections of other state laws relating to public health and public health authorities.
7. Special rules and regulations promulgated by the state commissioner of health in accordance with the public health law and the sanitary code.
8. Index.

Municipal Health Reports and Bulletins

Although there are many municipal health departments which fail to publish annual reports of their operations, either because of lack of funds or other reason less compelling, annual reports of one kind or another, good, bad, and indifferent, represent in most cities the chief medium of public information about health work. They range in form and character from mere typewritten summaries of vital statistics and public health expenditures, designed mainly for the review of municipal officials, to the most elaborately bound and illustrated volumes, containing financial and other statistics, essays on health subjects by departmental officials, health laws and ordinances, and a great variety of miscellaneous and uncorrelated facts of educational value, perhaps, but not suited to the purposes of a municipal report.

Before outlining what an annual health department report ought to contain, let us consider the purposes which it should serve. These are briefly:

1. As an account of the stewardship of public health authorities during a given fiscal period for the review of their superior officers in government and the citizen taxpayers.
2. As a medium of general education and information on public health organization, procedure, aims, and ideals.
3. As a basis for determining the need for further expansion of municipal health program and betterments of existing service.
4. As a means of comparing the character and volume of health work done, results obtained and costs in the given city, with similar facts in other cities.
5. As a permanent record, which with similar records of other years, will make possible an appraisal of municipal health progress and furnish the material for research in municipal health administration.
6. As a medium for the exchange of ideas and information with other municipal health authorities.

The following quotation taken from a study of the annual report of a health department in a city of over 100,000 population is not merely a characterization of the report of this particular health department; it pictures fairly well the annual reports of scores of municipal departments which have been prepared without adequate thought of the purposes which they should serve.

When the preceding board of health went out of office, it left to the present board an annual report for 1917 in preparation for publication. A single badly typed copy of this incomplete report on the activities of the board of health in 1917 was, at the time of this survey, on file in the health office, but the educational value of this material is so little that it is hardly worth while to publish it. Furthermore, the records available in the health department are in such bad state that even if the present board of health wished to add to the information contained in the report regarding 1917 health work, it could not do so satisfactorily.

The report begins with the statement "Seldom, if ever has Wilmington enjoyed so satisfactory a year from the standpoint of health." If the records available have any meaning, it is not clear how any citizen can "enjoy" knowing that his city had in 1917 an abnormally high death rate; that its infant mortality rate in 1917 was appalling;

that the health department of 1917 was inefficient and extravagant of its meagre funds; and that absolutely no important constructive work was done in the year reviewed.

The report goes on to summarize the number of cases of communicable diseases and the deaths therefrom, but comment is offered only regarding diphtheria, scarlet fever, and measles in spite of the fact that many other serious diseases occurred and that there was a sharp outbreak of typhoid fever which was responsible for at least thirty deaths. All that is said about this epidemic of typhoid is "with the exception of one slight epidemic of typhoid fever which we were able to trace to its source and eliminate the cause, we had only a very small percentage of contagious and infectious disease." If the typhoid epidemic was important enough to be mentioned even thus casually, why was it not considered worth while to tell the citizens of Wilmington what the "sources" were and how the "causes" were eliminated. Certainly, there is no evidence in the record to show that the sources were or how they were "eliminated."

A summary of the distribution of a few communicable diseases by wards is given, but the only diseases included in this summary are: scarlet fever, diphtheria, measles, smallpox, poliomyelitis, and typhoid fever. Nothing is said about tuberculosis from which there were more than 150 deaths recorded; nothing of diarrhea and enteritis of infants from which over 100 babies under two years died; nothing about whooping cough which resulted in 10 deaths; nothing about anthrax of which there were at least 7 cases reported; nothing about the many other preventable diseases, such as syphilis, gonorrhea, puerperal septicemia, etc., from which illness and death are constantly occurring. In fact, as far as preventable diseases are concerned, the annual report is worth less than nothing because it gives citizens a very faulty conception of the situation in Wilmington.

Several pages of the report are devoted to a treatise on the medical aspects of food conservation, a matter perhaps of some importance but of relatively little educational value when compared with the value of a treatise on infant mortality, and why Wilmington is so far behind other cities of its class in reducing its infant mortality rate.

Finally, the report summarizes in the briefest possible way the report of the meat inspector, the milk inspector, the city physician, and the executive officers—but except for the report of the meat inspector who has a very clear cut idea of his duty and imagination enough to see what is needed to make his work more efficient, these reports are useless. For example, the city physician reports the number of outside calls, the number of office calls, the number of diphtheria cultures examined, and the number of patients sent to various institutions. He says nothing about what kind of cases were visited and treated and what the results of treatment were; makes no

observations on the social conditions of the community he had every opportunity to observe; fails to report what his examination of diphtheria cultures disclosed; makes no statement as to why patients were sent to hospitals and what happened to them after; and furnishes no recommendations relative to his own work. The milk inspector reports only the number of inspections or investigations of milk stores and the examinations of milk made. He says nothing about what was found, and has no suggestions to offer. The executive officers' report is merely a summary of sanitary inspections and investigations made and has absolutely no value to the citizen who really wishes to know how his money was spent for the service or what results were obtained.

The only inspiration is in the report of the meat inspector who offers certain recommendations for the improvement of his service and in the few minor recommendations of the secretary of the board. As a whole, the report is not worth printing because of its lack of complete and accurate statistical data and informative comment on local health matters. Furthermore, it has been "padded" with lists of members of the various committees of council and a roster of physicians and undertakers of the city.

The chief purpose of an annual health report is to inform officials and citizens what has been accomplished by its official health body and what health work costs; to present a plan or program for work to be done with recommendations for extensions of service, improved ordinances and improved procedure; to make health matters so plain to the citizen that he will know how to coöperate. In short, its purpose is not only to give account of stewardship, but to educate. The reports of previous health boards of Wilmington have done neither.[1]

Keeping in mind, then, the uses to be made of an annual report, we may outline its table of contents as follows:

1. A brief description of the general organization of the department and its administrative program, including a summary of personnel in the various units of the organization. A graphic chart of the organization helps to make clear the lines of responsibility of the various officers and the relation of the special bureau or division units.

2. A summary statement by the health officer in clear, not too technical terms, of the general status of community health with appropriate comment on especially interesting features of the work during the year, changes in policy and personnel, future needs

[1] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Wilmington, Delaware,* 1919 (typewritten), pp. 278-281.

with recommendations for meeting them, and the estimated cost of the proposed betterments.

3. Brief statistical summaries of the work of special bureau or division units as vital statistics, communicable disease control, child hygiene, food inspection, sanitary inspection, laboratory, public health education, etc. Each statistical summary should be accompanied by such explanatory notes as may be necessary to permit its ready interpretation by the average reader. Preferably statistics of work performed for the year under review should be shown in comparison with the preceding two, three, or five years, by the use of graphs.

4. A financial statement showing the total budget allotment and its distribution according to the major health functions or objects of expenditure, and emergency appropriations, if any; the expenditures made for each functional unit and for the department as a whole according to the budget allotments; the unexpended appropriations, if any; the per capita cost of all health activities and of each major functional unit of the service, and such other unit cost data as may be of special interest. Financial statistics, also, are preferably shown for the year reviewed in comparison with similar statistics of the preceding two, three, or five years. Graphs may be used to advantage.

Comparisons of quality, quantity, and cost of municipal health services in different cities from the evidence furnished by their annual reports, are, as a rule, difficult to make, first because of the many factors of purely local bearing which may affect these measurements, and second, because statistical summaries are rarely uniform in form, arrangement, or control. Comparatively little has been done toward the standardization of statistical reports of municipal health departments, except with respect to reports on vital statistics. For these reports, the rule is to follow in more or less detail the schedules employed by the United States Bureau of the Census. Valuable suggestions regarding statistical summaries of all kinds may be obtained from the annual reports of several of the large city departments of health, notably, New York, Chicago, Boston, and Providence, Rhode Island. In planning the presentation of statistical material the health officer should, however, make his objective that of adapting his presentation to the special requirements of his own situation and his own community rather than mere conformity to the standards adopted by other communities or other agencies. No forms or patterns are worth

following in the presentation of health information unless they help to make such information more self revealing. The best health department reports reviewed by the writer are those in which strong individuality is expressed. Among such reports are those of the health departments of Montclair, New Jersey, Toledo, Ohio, and Bluefield, West Virginia.

An important element in the usefulness of an annual report is the promptness of its issuance on the completion of the fiscal year. It is rare indeed to find the annual report of a municipal health department ready for distribution in printed form within three months after the completion of the fiscal period, and in perhaps a majority of cities, annual health department reports are not ready for distribution until from six months to a year or more after the end of the year reviewed. The delay in the preparation of annual reports is often cumulative, so that as time goes on the reports are more and more delayed with the result, in some instances, that it is impossible to secure an annual health report until about two years after the events which it reviews. Obviously, a report so long delayed is of little value except historically.

Many health departments issue brief monthly summaries of vital statistics, communicable disease prevalence, and general inspectional activities. These are extremely useful because of their timeliness and, if properly prepared, make the compilation of the annual report material easy. Monthly reports should be designed with essentially the same purposes in view as have been suggested in the case of annual reports. Because they follow more closely the events pictured and are better adapted to the purposes of newspaper publicity, they may be utilized in community health education through the press. When so used the statistical summaries should always be accompanied by the health officer's explanation of their current significance and application to community health interests.

Distribution of annual reports should be made according to carefully selected lists of representative men and women of the community who may be expected to use them for purposes of special reference, research and general information. In addition, a sufficient number of copies of the annual report should be made available for exchange with other municipal health departments whose reports may be of particular interest to local health officials for the comparison of health organization, procedure, and costs. Monthly reports which furnish information of particular bearing

on current health conditions should also be distributed according to a similar but more extended list of health officials, representatives of private health and welfare agencies, physicians, nurses, teachers and others who are especially interested in health betterment. Where monthly reports or bulletins are published, it is the usual practice for the health officer to add to their general popular interest by brief timely comment on changes in health policy or procedure, suggestions on the prevention of communicable diseases or other health dangers which may exist or impend, special articles on diet, recreation, ventilation, baby care, milk sanitation, etc. Among the best of the monthly bulletins or reports of this type issued by municipal health departments are those of New York City, Rochester, New York, Toronto, Canada, Newark, New Jersey, San Diego, California, and Cincinnati, Ohio.

Illustrations of Good Monthly and Weekly Bulletins

A recent issue (March, 1926) of the Rochester, New York, health bureau bulletin is an excellent illustration of its type, combining matter of popular interest with statistical summaries or reports on health bureau activities. The bulletin of twelve pages is about six by nine inches in size. On the cover with its title is a summary table showing the present population of the city, the rates per 1,000 population of births, marriages, and deaths, for the years 1921, 1922, 1923, 1924, and 1925, and the deaths under one year per 1,000 births (infant mortality rate), for the same years. Death rates per 1,000 population from diphtheria, measles, scarlet fever, typhoid fever, whooping cough, pneumonia, and tuberculosis (all forms) in these years are similarly shown in tabular form. The next three pages contain the health officer's comment in terse, epigrammatic paragraphs under such titles as: The Deaths for March; Clothes (the health value of clean clothes); Noises; Smoke; Who Was to Blame? (for the death of a patient because of improper treatment of diphtheria); Missing Needles (advice to physicians about the care of needles furnished them for taking blood specimens for the diagnosis of syphilis); Don't Dye Dancing (health dangers from the use of certain dyes in colored shoes); Rabies; Building (the remodeling of the health bureau's quarters); Laboratories (transfer of health bureau laboratory to new quarters).

The succeeding eight pages include the following statistical sum-

maries: Vital Statistics—March; Monthly Report of Health Physicians and Nurses; Retail (milk) Dealers' Report of Bacteria (counts) for March; Report of Ice Cream Examination for March-April; Infectious Diseases (cases and deaths for previous five years and for first three months of 1926); Consultations and Clinics (at the health office); Infectious Disease Clinics (at public dispensaries); Prenatal Clinics (at public schools); Inspections of Homes Boarding Children; Office Work Against Infectious Diseases; Examinations Made in the Chemical and Bacteriological Laboratories; Plumbing and Drainage (installations and inspections); Food and Sanitation (routine inspections, special investigations, nuisances abated, prosecutions, etc.); Rochester Municipal Hospital Report (isolation hospital); Physicians District Work for Sick Poor; Tonsil and Adenoid Clinic (report of operations).

In some of the largest cities weekly as well as monthly bulletins are published which contain much the same kind of material. These bulletins are even more popular in style. Typical of weekly bulletins are those of the New York City and Chicago health departments. The latter with its title "Chicago Health" is a four-page folder, about six by eight inches in size. The issue of April 20, 1926, is typical. The cover is illuminated by a cartoon showing disease germs "Before the Bar of Health" where the householder sits in judgment upon them. The remaining pages, also illustrated by small cartoons, contain: "The Hurt of Dirt, Thoughts on Disinfection," by the Commissioner of Health. The "thoughts" are paragraphed as Dust and Disease Germs; The Necessity of Personal Cleanliness; General Cleanliness as Disease Prevention; Eternal Cleanliness the Price of Health; Learn to Keep House Properly; Disinfection. The bulletin concludes with an announcement to mothers that subsequent issues will consist of letters to mothers on the care of babies, and that copies of the bulletins will be mailed to the mothers of babies whose births are registered in Chicago. Health bulletins of this type have a high educational value.

The extent to which a municipal health department may reasonably expand its health educational services through the distribution of annual reports and weekly and monthly bulletins will depend to a large extent upon the funds available for general health purposes. It should in any case provide for proper distribution of an annual report, and if possible, a monthly report and

bulletin on topics of current health interest. Few except the largest cities will be able to do more than this, although such popular weekly bulletins as that of Chicago have undoubtedly a very high value in general community education and in encouraging coöperation for health.

Other Health Educational Activities

Other special educational activities of municipal health departments include:

1. The preparation and distribution of special pamphlets on communicable diseases, child hygiene, milk sanitation, etc.
2. The utilization of the newspapers for items of especial current health interest or "feature" stories.
3. The development of a lecture service to be made available to civic organizations, women's clubs, labor forums, churches, schools, etc.
4. The preparation of health exhibit material and its use either as small traveling exhibits on special subjects in schools, libraries, and other public buildings, or in a general annual exhibit in a large auditorium.
5. The utilization of health educational films, either in moving picture houses and other places of public entertainment or in the schools.
6. Educational campaigns and contests, such as clean up days or weeks, fly prevention campaigns, antispitting campaigns, better baby contests, health poster and essay contests for school children, etc.

Educational activities of such character do not call for large expenditure provided all other resources are taken advantage of by the health officer. A great deal of the special pamphlet and exhibit material desired for general distribution can be obtained free, as a loan, or at relatively small cost from the United States Public Health Service, the Federal Children's Bureau and Bureau of Education, state health departments, and such national organizations as the American Child Health Association, American Public Health Association, National Committee for the Prevention of Blindness, National Committee for Mental Hygiene, American Red Cross, National Tuberculosis Association, American Social Hygiene Association, the Metropolitan Life Insurance Company, and many others. Some of these agencies publish excellent health educational pamphlets which are so prepared that

they may be purchased and sent out by local health departments under their own imprints.[2]

The United States Public Health Service furnishes special releases of short items of general health interest adapted for general use as newspaper "fillers." These serve local health officers as a guide in the preparation of similar matter of more direct local application. The health officer who wishes to know how to use the newspapers for his purposes and is able to furnish them with brief items which have real news value, can reach a much greater number of people than can be reached in any other way, and his messages, if adapted to the purpose, have a weight not carried by his more official publicity.

There is a distinct value in the direct presentation of health information by lectures and informal talks before organized groups of the community, and the opportunity which such health educational work offers for the personal contact of health officials with the leaders in community thought and action should be seized on all possible occasions. Women's organizations are particularly interested in health work and are as a rule more active and aggressive than the men in their coöperation with health authorities. The writer has found that organized labor groups are particularly alive to health problems and eager for information. Special lectures on problems of industrial hygiene and other matters, such as housing, food sanitation, child health, etc., before such groups are more likely to result in definite, organized effort for health betterment than lectures before organizations whose members are less cognizant of the relation between health and income. Health officials are called upon to do a great deal of speech-making, much of which is relatively barren of result. They cannot afford to ignore many requests for speeches even though it often means time and energy wasted. But in order to reach the groups whose health education is most desired, it is necessary for the health officer to plan his speech-making rather than to leave it to chance, in other words, to make the speaking opportunities rather than have them made for him through chance requests. If so organized, it is possible for him to shift a part of the speaking burden from himself to his coworkers.

Health exhibits have been used to good advantage by many cities, and doubtless could be utilized much more extensively than

[2] "Some Publications Suitable for General Distribution," *Public Health Reports,* April 16, 1926.

they are at present. The health exhibit is merely a sort of museum in which health facts, methods, and aims are shown by means of pictures and other forms of visual education, such as graphic charts showing the deaths from communicable diseases and infant mortality; pictures of clean and dirty dairies; living healthy babies and the things which contribute to their health; sediment test cards showing the difference between clean and dirty milk; milk testing equipment; models of good and bad houses; posters on fly, mosquito, and rat dangers to health; live mosquitoes breeding in glass jars, etc. All such material can be readily provided by health employees for exhibit purposes at small cost. Small traveling exhibits of especial interest to school children can easily be prepared for school exhibition. Permanent picture exhibits in the city hall, the public library, and other public places are helpful in explaining where the taxpayers' money goes and what it does. Any occasion such as a food show, flower show, or automobile show furnishes an opportunity for the use of the health exhibit.

Exhibit material costs very little if it is "home made" and the home made exhibit material is quite often superior to that purchased from commercial concerns. There is a great deal of valuable poster material which can be obtained as a loan or purchased at small cost from such organizations as the American Social Hygiene Association, the American Child Health Association and National Tuberculosis Association. In planning an exhibit, the first thing is to lay out a schedule of exhibit materials and objects. If the exhibit is being prepared by a private agency in coöperation with the health department, the health officer's advice on the material best adapted to exhibit purposes should be secured. The development of the material in the various special fields of health service should be entrusted to those most familiar with activities and needs in these fields. Supplies for lettering, mounting charts, etc., can be bought cheaply from commercial organizations specializing in exhibit equipment. Usually some one can be found in the health department who has a flair for chart and poster making and a sense of values in the graphic presentation of facts. The material for the exhibit should be so selected and the posters and graphs so developed that they can be used over and over again with such revision as is necessary to bring them up to date.

Moving picture films have not been greatly used by health departments except in the larger cities. A few health departments have prepared special films of their own. Several of the national

health organizations previously mentioned have prepared films on general and special health subjects which are available for limited use by local health authorities. The Metropolitan Life Insurance Company has also made some excellent films adapted for general health educational purposes. The United States Public Health Service has available series of special lantern slides on a great variety of subjects which are loaned to health authorities. Full size, one reel, or longer moving pictures are costly, and unless made under expert supervision are not likely to be of great value. It is difficult, moreover, to maintain interest in long health films unless they are presented in story form, and when so presented, it is not easy to maintain proper balance between fact and fancy. Manufacturers of moving picture cameras have recently put on the market small cheap machines with which films can readily be made by health employees, and shown in connection with health lectures and talks on special phases of community health work as visiting nurse activities, school medical inspection, dairy inspection, etc. Except for such limited use of moving pictures and perhaps the preparation of health slides for use in commercial moving picture houses between pictures or at intermissions, few health departments, except in the largest cities, can afford to feature moving pictures in their educational campaigns.

Clean up, fly swatting, antispitting, and other campaigns have a very limited educational value. They arouse some temporary interest in municipal sanitation, if given a great deal of newspaper publicity, but it may well be doubted if the expenditure of time and money necessary to "put over" successful campaigns of this kind produces commensurate result in health betterment. "Revival" methods in health education are of little permanent value. Prize essay and poster contests among school children and "better baby" contests fall in that same category with the various campaigns above mentioned. Their health value is chiefly that they give oportunity for good news stories in the daily press.[3]

The Organization of a Bureau or Division of Public Health Education

In cities of 100,000 population or over, the great amount of

[3] Evart G. Routzahn, Editor, "Department of Publicity and Education," *American Journal of Public Health* (a monthly review of current health educational activities along all lines). See also *Hygeia* (popular monthly health magazine of the American Medical Association; contains many valuable suggestions for popularizing health facts).

detail work involved in the preparing, editing and distributing of health educational material, arranging exhibits, lecture courses, etc., and establishing coöperative relations with the press and other agencies, makes it difficult for the health officer to give a great deal of time to such matters. He should plan the educational program and exercise a rigid censorship of all publicity in the name of the health department, but the routine work is preferably carried on under the direction of an assistant in charge of a division or bureau of public health education. Except in the largest cities, that is, those of about 500,000 population or more, a division of public health education as a special unit of the general administrative office or bureau of administration would meet all requirements. The assistant in charge of such a division should be a person experienced in publicity methods though not necessarily an expert in health education. Perhaps, one other assistant for routine clerical work would be needed. In the largest cities, that is, those over 500,000 population, it would probably be found desirable to create a bureau of public health education coördinate with other bureaus of the department and to put such a bureau in the complete charge of an expert on health educational publicity, that is, one who understands fully the aims of health education and is thoroughly trained not only in the technique of publicity, but in gauging the effectiveness of the various methods used. In such a bureau, the director would be responsible for developing the program of health education and carrying it out, subject, however, always to the review of the health executive, in order that no publicity may be put forth which would be contrary to general health policy. In addition to the director, one or two clerical assistants would probably be needed in such a bureau. The difference between the two types of organization as described, namely, the division or section of health education of the general administrative office and the bureau of health education, coördinate with other functional bureaus of the department, is merely that in the former the health officer assumes personal responsibility for the direction of educational work, and in the latter, technical direction is turned over to an especially trained and experienced person.

In the equipment of a bureau or division of health education, no expensive apparatus is needed unless the amount of distributed matter is sufficient to warrant the use of the addressograph machine. Where several thousand copies of bulletins, pamphlets,

etc., are sent out yearly, the use of this piece of equipment saves considerable time and expense. Scrap books on special phases of health educational activities are desirable so that newspaper clippings, special feature articles, etc., may be kept for permanent record. If a general working library is maintained by the health department, it should be under the direction of the officer in charge of educational work and its material should be made available for reference to health employees and the general public. In addition to general works of reference on public health, effort should be made to keep complete files of health publications issued by the federal governmet, state health departments, and the best municipal health department reports and bulletins. All exhibit material including charts, posters, lantern slides, films, etc., should be kept under control by the chief of the health educational service.

Records should be kept which will show as far as possible the character and extent of educational work performed, numbers of copies of reports and bulletins distributed, lectures and exhibits arranged and their attendance, news items and special feature stories published, special requests for information, and other data necessary to permit an estimate of the general usefulness of the service. Such information so largely quantitative would not accurately measure the benefits of health educational work, but it would at least evidence what was done for the money expended.

The cost of maintaining a special unit of health educational work will depend, naturally, upon whether or not there is need for a full time expert director and special staff for such unit, and upon the extent and character of the activities carried on. In general, it may be estimated that a reasonable minimum expenditure for such work will be from 2 to 4 per cent of the total budget for essential health services not including the maintenance and operation of hospital services. In a city of 100,000 population with a total budget of $100,000, an expenditure of $2,000 to $4,000 would, therefore, be required for ordinary educational purposes. It is doubtful if even the ordinary educational activities could be supported for 2 to 4 per cent of the total budget if the budget for essential health activities were less than $1 per capita. Costs may, however, be considerably reduced where educational work is so organized as to take full advantage of postal regulations regarding the distribution of official publications and of the coöp-

eration of all agencies, official and unofficial, in the preparation, publication, distribution, and exhibition of educational matter. In this type of health work, as in all others, what is everybody's business is likely to nobody's business, and the employment of an expert director and staff for the work is, therefore, desirable in order to obtain the greatest return for the expenditure made.

CHAPTER XV

HEALTH EXPENDITURES AND REVENUES

How much a city should spend for health service can be determined only by careful and comprehensive study of community needs and resources. There is wide variation among cities in the amounts spent per capita for health and as wide variation in the results of expenditure. If the slogan "Public health is purchasable" is accepted without reservation, it might be supposed that the community spending the more money for health purposes would secure the greater health benefit. But this is not always the case. It is probably true that any community spending less than fifty cents per caipta for official disease prevention work does not spend enough to meet modern requirements, but an expenditure of fifty cents per capita in one city may produce far greater health benefit than twice that expenditure in another, either because it is more wisely spent, or because the health betterments for which it is spent can be bought more cheaply.

In American cities, health expenditures for essentially the same purposes vary from about ten cents per capita to a dollar or more. In view of the fact that the principles underlying modern health practice in disease prevention are quite generally recognized, one would not expect such wide variation in per capita expenditure, but several reasons for this situation may be cited. If the health officer has failed to cultivate citizen support and has not carried on an adequate program of popular health education, his budget is likely to reflect the ignorance of public officials and the public of anything except the traditional nuisance prevention rôle of the health agency. It is possible, of course, that his budget is small because the character and composition of the population, living and working conditions, climate, environment, etc. are particularly favorable to health, and larger expenditure is unnecessary; that is, health can be purchased more cheaply. On the other hand, the health budget may be large either because the actual need of large expenditure is duly recognized by the public as the result of the

health officer's educational work, or because, through miseducation of the public, endorsement has been given to a program of expenditure that is extravagant and wasteful of funds.

It must further be clearly understood that the phrase, per capita expenditure for health, properly used, refers only to expenditures which are directly applied to disease prevention and control in its many aspects. The term is so often improperly used to cover all of the activities of a health department regardless of their nature, that one must be sure in making comparisons of the per capita expenditures of cities that such expenditures have a comparable basis in purpose. For example, the health department of one city may be responsible for the direction and maintenance of a great variety of services for the treatment of disease, such as hospitals, dispensaries, sanatoria, etc., as well as other activities, such as plumbing inspection, garbage and refuse disposal, which are not primarily disease preventive in character. Obviously, if the "per capita expenditure for health," as calculated in this city, includes all of these various activities, it would be futile to compare this expenditure figure with that of another health department which was not responsible for similar work.

So, in making comparisons of per capita expenditure for health, it is the rule to limit the application of this figure to certain "strictly defined health services for the prevention of disease." As classified by the American Public Health Association in its survey of the eighty-three cities, previously referred to, these "strictly defined health services" are:

Administration (overhead services, including health education),
Communicable disease control (general),
Tuberculosis control,
Venereal disease control,
Infant welfare,
School health supervision,
Public health nursing,
Laboratory service,
Food inspection,
Sanitary inspection,
Vital statistics, and
Other and nonclassifiable.

These items cover all expenditures for those activities of health departments or health bureaus which deal directly with disease

prevention, except expenditures for communicable disease hospitals and sanatoria.

Relative Values in Health Expenditure

Before a health officer can determine intelligently what his budget ought to be, he will need to know just what ought to be done and just what kind of an organization is needed to do it. This means, also, that he must determine the value in community health benefit which may be obtained through each of the various activities which he proposes to carry on, and adjust his budget and organization accordingly. In justice to the taxpayer, the health executive ought not to ask for an appropriation to meet the requirements of an organization and program which cannot produce the health benefits which the public has a right to expect. If, for example, the infant death rate of the community is high, because of the failure of the government to provide an adequate staff of trained nurses for prevention of infant mortality, it would be a decidedly uneconomic use of public funds to spend money needed for such work for the relatively unproductive work of nuisance inspection. It would, likewise, be an extravagance to spend large sums for routine inspection of food stores, and overlook proper registration and control of tuberculosis or other communicable disease.

Many studies have been made by competent investigators to determine how the various activities for disease prevention rank in the production of measurable health benefits to a community. Although the precise weights given to these activities by different authorities show considerable variation, all authorities are in substantial agreement on their relative importance in the health program. The American Public Health Association has recently published an appraisal form for city health work, which is designed to make possible the scoring of municipal health activities according to their conformance to certain arbitrary but commonly recognized standards of performance.[1] Each of the activities or functions of disease prevention which has a direct application to the problem of disease prevention (exclusive of "overhead"

[1] "An Appraisal Form for City Health Work," *American Journal of Public Health*, January, 1926. For the application of this form in health surveys see *A Health Survey of 86 Cities* by the Research Division of the American Child Health Association, New York. Also "Report on the Appraisal of Health Service for the Year 1925 in Fifteen Illinois Cities," *Illinois Health News*, May-June, 1926, State Department of Health, Springfield, Illinois.

activities) is given a numerical rating of perfection, with which its actual rating can be compared. According to this schedule of ratings, the relative values of the eleven "common activities," that is, those which are recognized as essential in all municipal health programs, are, in summary, as follows:

	Activity	*Points*
1.	Vital statistics	60
2.	Communicable disease control (general)	175
3.	Venereal disease control	50
4.	Tuberculosis control	100
5.	Prenatal child health	75
6.	Infant health	75
7.	Preschool child health	50
8.	School child health	150
9.	Sanitation; food and milk controls; water; sewerage	175
10.	Laboratory	70
11.	Popular health instruction	20
	Total "Common Activities"	1,000

Provision is made in this appraisal form for rating, also, various special activities, the number and nature of which vary considerably from city to city.

If such rating schedules could be regarded as representing accurately the relative values of the health activities carried on, they would be of great practical use in determining what the health budget should be and how it should be spent. For example, if, in a given city, an appropriation of $100,000 were available for the above activities, it would be quite logical to spend the money as follows, according to the values indicated in the schedule:

1.	Vital statistics	6	per cent or	$6,000
2.	Communicable disease control (general)	17.5	per cent or	17,500
3.	Venereal disease control	5	per cent or	5,000
4.	Tuberculosis control	10	per cent or	10,000
5.	Prenatal child health	7.5	per cent or	7,500
6.	Infant health	7.5	per cent or	7,500
7.	Preschool child health	5	per cent or	5,000

8.	School child health	15 per cent or	$15,000
9.	Sanitation; food and milk; water; sewerage; etc.	17.5 per cent or	17,500
10.	Laboratory	7 per cent or	7,000
11.	Popular health instruction	2 per cent or	2,000
	Total budget		$100,000

It is clear that for an intelligent distribution of budget there must be some such determination of relative values by the health officer, but in practice he must make his determination not solely on the basis of any such arbitrary schedules of values, but according to the facts as to his own community needs, as he knows them and in conformity with the laws under which he must act. The chief criticism of such an appraisal form, as has been described, is that it is too often used for rating municipal health services in cities where conditions vary so widely that the same yardstick cannot be applied.

To sum up our argument, proper budgeting for health work means the determination of the relative values, in terms of health productiveness, of the activities to be carried on in the given community, and an allotment of the health budget which will, as far as possible, insure that public funds are spent accordingly. Experience has clearly proved that the activities for the control of communicable diseases and for the protection of child health outweigh in value all others, and no matter what the size of the health budget, these activities combined should be allotted from fifty to seventy per cent of the total budget for "strictly defined health services" in the average community. The allotment to other activities will depend largely on circumstances in the individual cities, but in general we may say that laboratory service, vital statistics, and health education are next in order of importance, with routine food inspection, except milk inspection, and nuisance control last. Milk inspection may be, and usually is, a most important feature of control of communicable diseases, and the protection of child health.

Health Expenditure Distribution in Some American Cities

The report of the survey of the eighty-three large cities by the American Public Health Association coöperating with the United States Public Health Service, previously cited, gives some very

interesting data as to actual expenditures for health work in these cities. For seventy-two cities, from which satisfactory data could be obtained, the distribution of expenditures was as follows:

Character of Service	*Per Cent of Total Expenditure*
Administration	11.3
Communicable disease control (general)	15.4
Tuberculosis control	3.3
Venereal disease control	2.5
Infant welfare	7.7
School health supervision	8.4
Public health nursing	3.4
Laboratories	7.0
Food inspection	14.2
Sanitary inspection	19.4
Vital statistics	3.0
Miscellaneous	4.4
Total	100.0

From this table it would appear that, in the majority of the cities studied, there is a decided lack of appreciation of relative values in health expenditures. Of the total health expenditures of the seventy-two cities, 33.6 per cent went for the combined work of food and sanitary inspection which have a relatively low value in health productiveness and only 19.5 per cent for the combined activities for infant welfare, school health supervision, and public health nursing, all of which have an extremely high health value. Only 21.2 per cent of the total expenditures was devoted to control of communicable diseases, including tuberculosis and venereal diseases. While recognizing that local conditions and laws have a certain weight in determining how health expenditures ought to be made, it is clear that readjustment of budget allotments is indicated in many of these cities. It is characteristic of health practice, in the majority of American cities, that sanitary inspection and food inspection, other than milk inspection, have been supported at the expense of other services more needed and more productive, as the following excerpt illustrates:

> Of deeper significance than the defects inherent in the type of board administration of health work from which Charleston has suffered is the failure of public officials and citizens, generally, to appreciate the

fact that modern health service means the application of known and tested scientific methods. Ancient theories of the spread of disease by emanations from garbage piles, weeds, rubbish heaps, recently excavated earth, wet ground, etc., have long since been discarded by progressive health departments. Prevention of disease consists, in the main, in finding the disease infected persons and so controlling them that they cannot infect others directly by contact or indirectly through media which they may have contaminated. Yet, in spite of these known truths about disease and the methods of its prevention, the Charleston health board has continued to spend its effort and money in the routine inspection and regulation of nuisances, many of which have no effect whatever on the health of the community, although offensive perhaps to the eyes and noses of citizens. The public, because miseducated in these matters, has been more concerned about Charleston's unsightly garbage dumps and weed-grown vacant lots than about the terribly high death rate of babies, the wide prevalance of tuberculosis, the large numbers of cases of typhoid fever, pellegra, venereal disease, and other preventable diseases that take heavy toll of human life. It is this misdirection of energy on the part of previous boards of health that is responsible for the miseducation of the public and for waste of public funds for health conservation. . . .

The total expenditure of the health department for 1923 was $32,105.07 or forty-five cents per capita, assuming a population of 70,305. Efficient health service requires not only that enough money shall be provided to carry on essential activities, but that such money as is spent shall be spent intelligently for service that produces health returns. Neither of these requirements has been met in Charleston. Even with an expenditure of forty-five cents per capita, which is somewhat below the average of health efficient cities in Charleston's population class, far more could have been accomplished if this money had been spent for more productive work. No matter how much money is spent, health will not be secured unless funds are used to buy health values and not mere health labels.

The following summary of expenditure according to function shows where the health department's money went in 1923:

1. Personal Services		
General administration and vital statistics		
Health officer	$ 4,000	
Chief clerk	1,800	
Stenographer	720	
		$ 6,520
Control of communicable diseases		
Trained nurse	1,500	1,500

Sanitary inspection		
Chief inspector	$ 1,800	
Sanitary inspectors, eight at $1,080	8,640	
		$10,440
Food inspection		
Chief inspector (part time)	2,400	
Veterinarian (part time)	1,200	
Food inspectors, two at $1,200	2,400	
		6,000
Laboratory service		
Bacteriologist (part time)	1,800	
Assistant bacteriologist	1,500	
		3,300
Clinic service		
Clinic physician (part time)	100	100
Total Personal Services		$27,860

2. Other Than Personal Services

General administration and vital statistics		
Auto upkeep	$ 199.01	
Telephone	12.60	
Office expense	134.47	
Printing and stationery	509.02	
		855.10
Control of communicable diseases		
Auto upkeep	299.62	
Disinfectants	486.98	
Care of contagious cases	1,132.83	
		1,919.63
Food inspection		
Auto upkeep	200.00	
Supplies and telephone	146.13	
		346.13
Laboratory service		
Supplies	677.21	
Rent of laboratory	300.00	
		977.21
Miscellaneous		
Sewer on city property	147.00	147.00
Total Other Than Personal Services		4,245.07
Grand Total—All Purposes		$32,105.07

It is apparent from review of the above distribution of expenditure that the health department is not utilizing its funds to good advantage. More than a third of the total budget goes for food and sanitary inspection which are relatively unproductive in community health, while services which are highly productive are ignored as, for example, tuberculosis and venereal disease control, infant hygiene and general health education. The need for reorganization of health work so that essential features of disease preventive work will be recognized and provided for in the budget is clearly indicated.[2]

Economic Use of Personal Services

To spend public health funds wisely requires far more than mere allotment of the health budget according to the relative health values of the activities carried on. It goes without saying that the amount of money which is made available for public health service should be sufficient to permit the various activities to be carried on according to approved standards, but more than that, the health budget should be so planned that the most efficient use can be made of the health organization's personnel. In most cities, where public health work is adequately organized, personal service, that is, the salaries of physicians, nurses, inspectors, clerks, and others, consumes more than three-fourths of the entire budget. Even though the funds available for health service are spent with due regard to the relative values of the activities carried on, it is clear that unless they are so spent as to make possible the efficient utilization of the health workers themselves, the health productiveness of the organization will be greatly reduced. The following excerpt illustrates well how, even with good organization and proper appreciation of relative values, a health officer can be handicapped by a lack of facilities necessary to the proper use of personnel.

The failure to provide adequate representation of essential health functions is not because of a lack of appreciation of health needs on the part of the board of health, but solely because the money necessary to provide complete and efficient service along all lines has not been made available. In the judgment of the examiner, the funds appropriated to the municipal department of health have been expended well and economically. It can be said without fear of contradiction that Cincinnati is getting all of the health service that its health

[2] New York Bureau of Municipal Research, *Report on a Survey of the Government of the City of Charleston, South Carolina,* 1924 (printed), pp. 119-120, 122-123.

appropriations warrant, in fact, in no other city with which the writer is familiar is a greater return of professional service being given for less money. Quoting the report of the committee on municipal health department practice of the American Public Health Association, "Cincinnati spends a higher percentage of total expenditures than any other city in this group for salaries, namely, 88.9 per cent," although health department employees, generally, receive lower salaries than those commonly paid for similar services in other comparable cities.

The statement above quoted requires explanation, in view of the low salary rates paid for professional health workers. The explanation is that Cincinnati, in its effort to economize on health service, has failed to equip its health department adequately, or to carry out those measures of health publicity and public information and education which the extent and character of its personal service warrant. It publishes no annual report; its sanitary bulletin has been discontinued; its sanitary code has not been revised since 1913; and other educational publicity measures have been discontinued for lack of funds. Transportation by automobile and otherwise has been denied many health executives and field workers, with the result that salary costs are greater and much of the effort of workers is relatively unproductive. No funds have been made available to the health executives for research in their special fields; technical journals needed by physicians, veterinarians, bacteriologists, and others, have not been supplied by the department, but purchased by such employees out of their own pockets; and the department library, if it may be dignified by that title, contains practically none of the recent publications on health administration and related technical subjects. Office equipment, necessary to economize the time of the health officer and his assistants, is conspicuous by its absence; adding and tabulating machines, photographic and mimeographic equipment, and other devices in daily use in many health departments have been denied the Cincinnati department because of lack of funds. These are but few of the many illustrations that might be cited to make clear why such a relatively high percentage of the total expenditures of the health department goes for personal service.

The Cincinnati health department needs more money if it is to provide adequately for the health service which citizens ask it to give, and to meet the needs of its health executives and employees for equipment and facilities that will economize their time and make their work more effective. The health officer asked for $179,000 for the current year; he was allowed $134,000, which is the same amount made available to him in 1922 and somewhat less than that of previous years, While the public demand for health service has been increasing steadily, the appropriations for health have been reduced instead of

augmented. Efficient health service cannot be provided for thirty-three cents per capita in Cincinnati. It was the judgment of competent investigators in 1920, that a fifty per cent increase of health appropriation was necessary, and at that time the health appropriation ($162,279.92) was even greater than in 1923 ($134,000). In the judgment of the writer, the same recommendation for a fifty per cent increase of health appropriations is amply justified at this time.[3]

The Health Budget as a Factor in Financial Control and Community Education

To prepare a health budget which will accurately express the health needs of the community, and to secure its enactment by the proper authority, is a paramount responsibility of the health officer. No matter how skilled he may be in the technique of disease prevention and health promotion, he will get nowhere with his program unless he is able to secure the funds necessary to carry it out. It is a common complaint of health officers that their work is handicapped by lack of funds and yet, few of those who complain will admit the truth that their failure to secure the funds desired is due largely to their own inability to offer convincing argument for the program. The writer has, time and again, seen a health officer come before a city council or board of estimate with estimates of what he would like to spend, but without enough supporting data to make good his case. A budget program calls not merely for an estimate of proposed expenditure, but full information about how it is to be spent, what results may reasonably be expected from the expenditure, and why the proposed expenditure is necessary. Many times health officers have made extravagant estimates of their needs on the theory that the amount they request will be reduced anyway, and so when they are called to defend their estimates by fact argument, they find themselves in difficulties. The health officer who has the facts at his finger tips, and is able to offer convincing argument for needed health betterments is much more likely to get the support due him, not only from the public but from those who appropriate public money. The public generally will support an efficient health officer, if given a fair opportunity to know what he is about and to understand the reason why it should support him. With the support of an informed public, the health officer is more likely to find his city

[3] Detroit Bureau of Governmental Research, *The Government of Cincinnati and Hamilton County, Ohio*, 1925 (printed), pp. 372-373.

or county board of estimate sympathetic to his budget requests, if they are properly made and well presented.

It is not within the scope of this volume to discuss in detail the form of the municipal budget or budget technique. The general arrangement of the health budget will be determined by the budget plan governing all municipal departments. There are, however, certain features of the health budget which are of special interest from the point of view of community education and coöperation, and we shall limit our discussion to these.

The health budget, to be of greatest educational value as well as an instrument for financial control, should be designed to show: (1) the units and subunits of the organization by which health work is to be done; (2) the nature of the functions and activities for which each organization unit or subunit is responsible; (3) the estimated cost of work to be performed by each unit expressed in terms of activities performed, personal service, and other things purchased. The health budget is, therefore, merely a program of expenditure which shows by what health units public money is to be spent, exactly what health aims it is proposed to carry out, and what things, including personal service, supplies, equipment, etc., are to be bought to carry out these aims effectively.

In many cities, it is the practice to present the health budget classified only according to the titles of the various units of the health organization. If such titles always defined the functions of the health service clearly, there would be little likelihood of any misunderstanding about what work is planned, but the title of the organization unit may give no clear picture of its work. For example, in one city, a sanitary inspection unit may be responsible for certain duties in the control of communicable diseases, for food inspection, plumbing inspection, housing inspection, and general nuisance control. In another city, the sanitary inspection unit may be concerned only with nuisance inspection. It is desirable, therefore, whatever the titles of the organization units of the health agency, that the budget show in full detail, the proposed expenditures of each unit classified according to the functions or subfunctions performed by such unit.

The extent to which proposed expenditures may be classified according to the objects of expenditure, *i.e.*, things purchased, will be governed by the budget classification applicable to all city departments. The things purchased by the health department, assuming that it is not responsible for the administration of hospitals or

other institutions, fall mainly into three groups, namely, personal service, supplies, and equipment. Since in such a department personal service may represent from 80 per cent or more of the total health budget, it is desirable that proposed expenditures for personal service under each function and subfunction be fully outlined. Salaries of regular, as well as temporary, employees, should be distributed according to a schedule of titles, which represents the nature of work performed, as medical inspectors, veterinarians, nurses, clerks, stenographers, telephone operators, etc. With respect to expenditures for supplies and equipment, these should also be classified according to the nature or use of the things to be purchased. Supplies may be defined as general office supplies, medical and surgical supplies, motor vehicle supplies, laboratory supplies, etc. Equipment may be defined as office equipment, motor equipment, laboratory equipment, etc.

Since, in preparing the budget of a hospital, there is need for more detailed analysis of proposed expenditure by objects, we shall consider the form of budget classification by objects in greater detail in Chapter XX, on hospital record keeping. As a rule, health service for disease prevention only, that is, for the essential sickness preventive functions, as we have previously described them, does not require large expenditures for supplies and equipment. Classification of expenditure by objects is, therefore, often set down simply as: (1) personal service, and (2) maintenance. It is, however, better to define what is meant by "maintenance" as above suggested.

Assuming that we are dealing with a health department which is responsible only for the essential functions of sickness prevention, and is organized in bureaus or divisions representing such functions or lines of activity, the budget should show for each bureau or division, the following distribution of expenditure:

1. Title of bureau or division (function)
   a. Title of subordinate bureau or division unit (subfunction or activity group)
      Personal services
         (Titles of positions and number of employees under each title listed)
      Supplies
         (Classified according to nature or use)
      Equipment
         (Classified according to nature or use)

b. Title of other subordinate bureau or division unit, if any
Personal services
(Classified as above)
Supplies
(Classified as above)
Equipment
(Classified as above)

Total bureau or division $

Cost Accounting

Although it should be unnecessary for the health officer to maintain a completely detailed system of accounts, provided the general accounting service of the government is properly organized, it is desirable that he have, for purposes of accounting, such information regarding expenditures as may be necessary to develop unit costs. This is a field of accounting to which relatively little study has been given, although there is no doubt that properly determined unit costs for comparable health services would be far more illuminating as to the relative efficiency of procedures than comparisons of health expenditures in gross, as represented by per capital expenditure.

It is clear that by comparisons of health expenditures in gross, or even by special functions, we cannot portray the great differences which may exist between cities with respect to the factors influencing such expenditures. The location of the health office may be an important factor in cost. If it is conveniently located so that there is a minimum loss of time on the part of field workers in getting to and from their field assignments, this will tend to conserve time and reduce cost. If the city is well served by transportation lines so that there is less time lost by field workers in going from place to place, this also will reduce cost. If automobiles are available, one inspector in the field with an automobile may be able to cover two or three times as much territory as an inspector on foot, and the increased service furnished may cost less. In the supervision of the health of school children, the location of schools may be a determining factor in cost of service; in food inspection, the location and character of abattoirs, markets, dairies, etc., may materially affect cost, etc. Before any comparisons are made, one should first have all the facts about the location of the city, the area of its jurisdiction and its environment, the nature of its institutions, the character and composition of its people, their

economic and social status, and other data not revealed in the bare figures of comparative cost. If, however, one can reduce general costs to unit costs and compare them, it is possible to come nearer to an appraisal of the relative value of health services. In any event, comparisons of unit costs so made will point specifically to the features of service requiring further study.

Suppose, for example, that of two cities of approximately 100,000 population each, expenditures for comparable sanitary inspection service was $15,000 in the one case, and $10,000 in the other, and that in the former 10,000 inspection per year were made as against 5,000 in the latter. The unit cost per inspection in the first would, therefore, be $1.50, and in the second $2. If then, these unit costs were further analyzed to show their distribution, salaries and wages of inspectors, transportation, supplies, etc., we would have the kind of information necessary to determine why costs were higher in one city than in the other. We would not perhaps have all of the information needed, but we would have enough to indicate where further inquiry ought to be made. If, let us say, the transportation cost for sanitary inspection, as included in the total unit cost of $1.50 in the one city, amounted to ten cents, and twenty cents in the city spending $2 per inspection, it would at least be clear that there were differences between the two services which ought to be further elucidated.

Just what unit costs the health executive may consider it desirable to record for administrative purposes will depend upon what he is trying to demonstrate. If he wants to show the need for further equipping his inspectors with automobiles, unit costs of inspection with and without automobiles should be determined. If he wants to show that greater efficiency of medical examination of school children will result by adding to his force of medical inspectors and nurses, the unit cost per examination with and without the addition to his force may offer a convincing argument. Even though gross cost may be increased by the appointment of more examiners, so many more examinations may be made, that unit cost may be materially reduced.

A few of the simpler basic unit costs that are useful for administrative purposes are:

1. Vital statistics,—cost per certificate, (birth, death, marriage, or other) recorded and filed.

2. Communicable disease control,—cost per case of disease registered and under departmental control.

3. Child hygiene,—cost per child registered and under health supervision.

4. Food inspection,—cost per inspection or inspection hour.

5. Sanitary inspection,—cost per inspection or inspection hour.

6. Laboratory service,—cost per laboratory examination or test.

7. Health education,—cost per copy of educational publications issued.

Such basic unit costs will need further analysis, in many instances, in order that their component unit costs may be derived. If there is a proper expenditure classification by function as well as object of expense, the derivation of such component units will be easy, and limited only by the detail in which the expenditures are accounted for and the amount of information furnished by service records.

It is apparent that no satisfactory system of cost accounting can be developed without complete and accurate service records and reports from all employees showing the character of the work done, the amount of time devoted to it and the results produced. If a health officer wished to make a comparison of the efficiency of the work of individual members of his sanitary inspection force engaged in comparable duties, he would need to know the total cost of work performed by each inspector, the number of inspections made by each, the number of hours each worked, and what results each obtained as measured perhaps by nuisance abatements. Unit cost figures showing for each individual, cost per inspection, cost per hour of inspection service, and cost per nuisance abated would help him greatly in determining the competency of his inspectors as well as the adequacy of his inspection program. The variety of unit cost data obtainable through a well developed record of expenditures and proper records of work done is almost unlimited. The value of such data as a guide to administration of health services can hardly be overestimated.

The development of a system of cost accounting depends upon the following procedures:

1. The determination of the units of expenditure and corresponding units of work suited to the particular purpose in view.

2. The maintenance of expenditure records which will show in the necessary detail, the amount of expenditure for each of the chosen units or subunits of the organization and for each special activity thereof.

3. The maintenance of a system of work records which will

show the amount and kind of work done by each of the chosen organization units, and by each member of these units.

It should be noted in the development of unit costs, expenditures, as we have used the term, refer only to the purchase of personal services and commodities which are consumed in the period under consideration. This is to say that one should not include the purchase price of an automobile for a nurse in the expenditure of the nursing unit for which the unit cost is to be derived. One might include depreciation on the automobile properly chargeable against any given period, but the purchase price should be regarded as capital outlay, and, therefore, to be excluded from operating expenses. In this particular case, the use of the automobile would be reflected in expenditures for gas, oil, tires, repairs, etc., and the number of miles of travel,—as cost per mile.

Unfortunately, there are relatively few automatic recording devices that can be used in health work. The time clock can be put to good use in recording hours of service of health workers, and time clocks in public offices, generally, would probably result in more work on the part of employees. Recording devices are available for registering automobile mileage, and there are certain other mechanical processes that can be automatically recorded. For unit costs generally, the health executive must, however, depend mainly upon the records made by the individual workers, and, therefore, largely subject to error. The records made by health workers, or any workers for that matter, will be better if the worker knows they are going to be used to determine his efficiency. If he knows that they are not going to be so used, there will not be much use of requiring him to submit them for they will be worth very little.

Miscellaneous Health Revenues

The health department is not to be regarded as a revenue producing agency. Its work is, in the main, done for the health of the community as a whole, and is supported by the community without special assessment against the individuals benefited. Nevertheless, the health department furnishes a great variety of services to the individual, particularly in the elimination of nuisances, and the prevention of his exploitation for commercial purposes, for which it is quite reasonable and proper that the individual should pay.

In 1917, Leonard M. Wallstein, commissioner of accounts in

New York City, made a study of certain special services of the city health department with the view of determining to what extent the cost of these services was properly returnable to the city, through permit and inspection fees from the individuals particularly benefited. Mr. Wallstein estimated that the city's revenues might be increased by over $350,000, through requiring individuals and corporations benefited by health department regulation to pay some of the cost thereof, instead of throwing the entire burden upon the public. Quoting his report on the subject, the advantage of this procedure through increased revenues are briefly summarized as follows:

The health department regulates and supervises certain occupations, through the requirement of obtaining its permits as prescribed in no less than fifty-one sections of the sanitary code. Under some of these sections, several permits of various characters are required, so that in all there are nearly one hundred permits of various kinds issued by the department. In every case where a permit is issued, there is the cost of the stationery and the clerical expense incident to the examination of the application, the writing of the permit, and the filing of the records. No permit can be issued without this minimum cost. Of all the permits issued, the expense is, in only a few cases, limited to the bare clerical cost. In the great majority of cases, some field inspection is required prior to issuing the permit, and after the permit is issued, more or less constant field inspection is necessary to enforce compliance with the rules of the department promulgated for safety, health, and comfort. None of this service or expense is now paid for by the firms or individuals whose occupations or businesses make the expense necessary, or who are its direct beneficiaries.

The major portion of the budgetary appropriations for the two bureaus above named (food and drug bureau and sanitary bureau) is spent in the regulation of trades, occupations, and businesses requiring permits. The work of the department in regulating certain insufficiently supervised business is hampered through lack of funds. . . . This work could be accomplished and the present work could be continued, at less cost to the taxpayers, if the same principals, as is applied to the fire department and other departments and bureaus, were applied to the health department, and if the persons and firms whose business is of such a character as to require regulation were compelled to pay the cost of that regulation through permit fees. At present, it is costing the department over $500,000 per year, without any substantial return in fees. By charging fees commensurate with

the services rendered, the greater part of this cost could be shifted from the general public to the privileged few.[4]

The argument offered by the writer of this report seems to be unassailable, at least, with respect to those regulatory activities having to do with the control of nuisances arising from businesses and occupations conducted for profit, particularly when the cost of regulation is out of all proportion to the return in community health.

The activities, businesses, trades, and occupations which might be expected to pay part of the cost of their health inspection and regulation, include the keeping of animals, slaughter houses, junk shops, lodging houses, food establishments of all kinds, soft drinks, ice cream, and confectionery stores and manufacturers, plumbing and house drainage, private collection of garbage and night soil, disposal of dead animals, fat rendering establishments, infants' boarding homes and commercial day nurseries, private bathing establishments, and many others.[5] The revenues to be derived from permit fees from persons maintaining such businesses and activities would perhaps not amount to more than a few hundred dollars in small cities, but in larger cities of 100,000 or more population, they might easily amount to several thousand dollars. In any case, however, effort should be made to collect as much money in fees from such sources as possible, without injustice to the individuals or firms paying them.

Briefly summarized, the essentials of municipal policy, with respect to the collection of fees from businesses or occupations requiring health regulation, are these:

1. Every individual or firm conducting a business for profit which calls for health department regulation should be required to obtain a permit therefor from the health department, and to pay to the city a fee sufficient to cover, at least, the initial cost of inspection, and the cost of preparing and issuing the permit.

2. All permit fees so collected, either by the health department or by other agency issuing the permit, should go into the general

[4] Leonard M. Wallstein, *A Plan for Reimbursing the City of New York for the Special Services of the Department of Health,* 1917 (printed, but not available for distribution).

[5] New York State Bureau of Municipal Information, *Report No. 2158, Services Performed by Municipal Health Department for Which a Charge Is Made,* Albany, 1926.

funds of the city along with all other departmental collections and tax revenues for general budgetary purposes.

Health departments should not collect license and permit fees if this can be avoided. If the city financial department has been properly organized, the health department's responsibility should be limited merely to the issuance and approval of licenses and permits. These should be issued and the fees collected by the city treasurer or his representative when the certificates of approval from the health department are presented by the proper persons. This plan is recommended in order to relieve health officials of all necessity for handling cash, and of maintaining special accounting records. When collections are made by the health department, the usual practice is to have a book for each type of permit or license issued. These books contain serially numbered license blanks which are attached to stubs. When the license or permit has been made out, entry is made on the stub of the facts necessary for record with a memorandum of the amount of money received. The license represents the licensee's receipt for the fee paid. These books with the collections of money are turned in to the proper fiscal officer monthly, or more often, for audit, and a receipt is issued to the health officer for the amount of money turned into the treasury. Under no conditions should health authorities be permitted to use these fees to augment departmental funds. This applies as well to all other receipts of the health department such as from miscellaneous sales.

CHAPTER XVI

THE RELATION OF MUNICIPAL HEALTH SERVICES TO OTHER OFFICIAL AND UNOFFICIAL HEALTH AGENCIES

Since municipalities derive their powers primarily from the state, it is proper that the state health department shall exercise a certain measure of supervision over local health administration, even though the general state municipal laws and municipal charters may confer broad "home rule" powers upon city governments. There is naturally considerable variation among the states with respect to the character and extent of the state health authority's dictation of municipal health administrative policy and program. In general, however, we may define state and municipal health relations as of three types.

The first type is that in which the state health authority determines the general organization of municipal health units, prescribes the qualifications, tenure, and salaries of their health officials and holds local government authorities to account therefor, fixes minimum standards of administrative practice, furnishes state aid generally to local health departments when necessary for the maintenance of such standards, and otherwise exercises a strong central control over them. This type is illustrated in Ohio where, under the public health law of 1919, the state was divided into general health districts and municipal health districts. A general health district includes all townships and municipalities of a county except those municipalities which are created municipal health districts. The municipal health district is a city of 25,000 or more population and such other cities between 10,000 and 25,000 population as maintained satisfactory standards of health administration at the time of passage of the act. The law defines the character and composition of district boards of health, outlines their procedure, fixes the minimum staff of the district unit, prescribed budget methods, authorizes state financial aid to districts on the approval of the state health authority, and gives that authority extremely broad powers in the enforcement of the state's mandates upon local health officials and agents.

The second type gives municipal governments much broader freedom and power of initiative and, while setting up certain minimum standards of local administrative practice, leaves local health authorities largely to their own devises in maintaining these standards. This type is illustrated in New York State where under the public health law of 1914 the state has defined the organization of local boards of health, and provided for the enactment of a sanitary code setting up minimum standards of administration applicable to all local jurisdictions, except the city of New York. Under this law the state is divided into fifteen sanitary districts, exclusive of New York City, and a state district sanitary supervisor is provided for each district. These sanitary supervisors are authorized to make studies of local health administration, confer with local officials, adjust questions of jurisdiction between them, assist in the maintenance of uniform standards of work, and otherwise act as the representative of the state health commissioner in the enforcement of the public health law and sanitary code. The state sanitary supervisors perform no administrative functions in their districts, but act rather as advisors and consultants to local officials.

The third type, if it may be called a type, is exemplified in those states where state governments have not as yet recognized their primary responsibility for the betterment of local health services, and, except in certain fields such as the registration of vital statistics and communicable diseases, have not prescribed and enforced standards of local administrative practice. There is little that is characteristic in the relations of state and municipal health departments where the state health departments are so limited in their authority, or so inadequately organized to exercise such authority as it has. Standards of health administration under such circumstances are likely to be low both centrally and locally. A good illustration of such a state is Nevada where the state health department undertakes little more than the enforcement of uniform vital statistics registration. There are very few states where state health departments are so handicapped in maintaining uniform standards of local health administration as in Nevada, but many in which the state government follows much the same policy of *laissez faire* with respect to local health practice.

Tendencies in the Relation of State and Local Health Services

There is clearly a growing tendency in this country toward con-

ferring upon state health departments much broader powers in control of local health administration. This seems inevitable in view of the fact that in the control of communicable diseases, it is impossible to provide adequate protection for the people of the state without insistence upon uniformly high standards of local procedure. Communicable diseases know no boundaries of local jurisdiction, and the failure of their control in one local area may, therefore, endanger the health of the people of the whole state. How far it is proper for the state to go in direct, centralized control of municipal health services is, however, a moot question. It is certain that under efficient, highly centralized, state control of local health administration, many local health departments will gain in routine efficiency, and the general level of administrative health practice will be raised. Health conditions, particularly in that "no man's land" which lies outside the jurisdiction of incorporated places, and in small towns and villages, will undoubtedly be improved through more complete control of their health activities by the state. On the other hand, it would appear that the gains made in small communities through strengthening the administrative control of local health services at the hands of the state health authority, will not be unaccompanied by some loss of initiative where local enterprise and civic pride have been strongly developed. In such cities, and there are many of them, health progress has been fostered by their reasonable independence of central state control.

Complete standardization of municipal health aims, ideals, and procedures by a central state authority is not a good thing, in the writer's opinion. The state government is a more or less nebulous affair to most citizens and they, as well as local officials, are either inclined to resent too much overlordship on the part of the state, or in submitting to it, lose their incentive for the adoption of higher standards than may be prescribed as the minimum for all cities. It is certainly true that the greatest advances in public health progress have come about as the result of municipal initiative and enterprise, and the competition between cities for health betterment. It is well enough for the state to define minimum standards of practice to which all local areas must conform but to reduce local health departments to a position of complete dependence upon authority from above is not a good thing for health progress.

To meet the health requirements of small areas outside of the

cities, the county health unit plan seems most satisfactory and in a majority of states county health departments have been established to exercise control of health matters, chiefly in the rural and semirural areas outside of the cities.[1] The county health unit plan has been best developed in the states of the south and west where the larger part of the population lives in such areas and has not therefore the benefits of well organized health services, such as are ordinarily found in cities. Since the county government is essentially a local administrative unit of the state government, a county health department would stand in a somewhat different relation to the state health department than would a city health department. The city is a more independent and self-controlled unit of government, operating as a corporation under a special charter granted by the state which recognizes its right to independence in local administrative matters within reasonable limits. Except, then, in those areas where county and city are coterminous, or where city and county consolidation of governmental agencies is otherwise desirable in order to eliminate conflicts and overlapping of jurisdiction, cities are rarely included in county health units.

Factors Governing State and Local Health Relations

The whole question of the relation of state and local health administration has been well summed up by Sir Arthur Newsholme, the celebrated English authority on public health. His comment on the situation in his own country offers much that is applicable to our own:

> The two branches of administration are in indissoluble partnership, and the shifting problem as to the best means for securing the maximum benefit to the community from their joint administration is one of great interest and importance.
>
> A comparison of the problem with that of the successful organization in the human body of the control of the nervous system over the bodily functions is useful. There are three levels of nervous activity. The brain cells control thought and volition; intermediate cells govern movement which are fairly complicated, as those of walking; while peripheral nervous elements direct the simplest movements in life. Thus by the application of what has been called a doctrine of levels, economy and efficiency of effort is secure in every part of the human system.

[1] "Directory of Whole Time County Health Officers 1926," *Public Health Reports,* April 16, 1926.

(a) The first condition of such efficiency in public health is the application for routine public health administration of the absolutely sound recommendation made by the Royal Sanitary Commission of 1869:

> "All powers requisite for the health of town and country should in every place be possessed by one responsible local authority . . . so that no area should be without such an authority, or have more than one."

(b) The second condition is so to balance central and local control as to secure maximum efficiency with the minimum amount of interference with local initiative.

Much of the failure to secure these two conditions of good government has arisen from the ineptitude and ignorance of many of our legislators. For these,—and for the more responsible officials,—a compulsory period of training or actual experience in local administration before they become eligible for legislative work, would greatly increase the efficiency of the public service.

(c) It would further conduce greatly to the efficiency of central administration and its satisfactory adjustment to local needs, were it practicable to arrange for opportunities to serve for a period with local authorities to be given to secretaries of departments before they take on their secretarial duties. One of the chief difficulties in central administration is the lack of knowledge on the part of central administrators of local administration; and the provision of interchange between central and local departments would materially enhance the efficiency of national service.

(d) A fourth condition is that, as indicated in the physiological analogy suggested above, the central health authority should concern itself with major matters and should avoid pernickity checking of the detailed work of local authorities, always subject to their fulfilling a minimum standard in the various branches of public health administration. It would not be difficult to formulate such a series of standards for different grades of sanitary authorities, conformity with which on the certificate of the responsible chief officials of the authority would minimize detailed inspection from the central authority, and the making of overelaborate periodical returns in respect of grant-aided activities.

(e) The physiological illustration, when applied to modern conditions, indicates a necessary limitation of the sound rule stated by the Royal Commission in 1869. At that time the main problems were local and limited in scope—scavenging, water supplies, fever hospitals, sewerage, etc. The rapid growth of population and the overflow of population from urban to rural areas have created novel problems, necessitating larger units of government for special pur-

poses. The relation of the county council to the constituent sanitary areas in a county illustrates this. For certain purposes this does not suffice. Thus schemes of water supply on a large scale may necessitate combined action on behalf of several towns and of a large county area. The West Riding Rivers Pollution Board furnishes a further example of administrative action overlapping many sanitary areas. A county and a county borough area contiguous to each other may form very uneconomical units for the provision of hospital accommodation; and machinery for compulsory joint action is needed. The Metropolitan Asylums Board is a good illustration of the value of pooling provision of hospitals for fever, for smallpox, for tuberculosis, and for mental deficiency, etc., for the entire metropolis. The question as to the method of appointment of such joint bodies needs careful consideration.[2]

Certainly no careful student of health administration can disagree with Dr. Newsholme's judgment on the factors which should govern the relations between the central or state and local health authorities. These factors, or "conditions," restated for emphasis and for application to the situation in this country, are:

1. No area of the state should be without a responsible local health authority or have more than one.

2. Central and local relations with respect to health control should be so adjusted that the state health department will not discourage local initiative.

3. The state health authority should concern itself with major matters of general health interest and the promulgation of minimum standards of local practice, but should not dictate detailed local procedures as long as such minimum standards are maintained.

Taking these three conditions, then, as our guide, we may outline the functions of a state health department in its supervisory and coöperative relations with local health departments as follows:

1. *Legislation*—Preparing, enacting, and promulgating a comprehensive code of sanitary regulations which shall be applicable within reasonable limitations to all local health jurisdictions.

2. *Consulting Service*—Furnishing to local authorities expert consulting service on all phases of health administration as requested.

3. *Laboratory Service*—Furnishing laboratory examination service as needed by local health authorities not having proper laboratory facilities, and encouraging local development and maintenance of local laboratory services wherever needed.

[2] Sir Arthur Newsholme, *The Ministry of Health*, pp. 92-95.

4. *Standards of Practice and Procedure*—Establishing and recommending such standards of practice and procedure as will facilitate efficient local health work and to permit a comparison of their work and its cost.

5. *Research*—Conducting special research studies which local health authorities cannot make because of their limited jurisdictions and lack of means, and publishing research findings for the information of health officials generally.

6. *Surveys and Demonstrations*—Making surveys of local health administration with the coöperation of the health officials and the public, and drafting community health programs based on the findings of such surveys. Where demonstrations are necessary to secure community coöperation the state authorities should offer all possible aid.

7. *Conferences and Health Courses for Local Officials*—Holding periodic conferences of local officials for the exchange of information and the development of coöperation, and conducting courses in health administrative practice for health officers and health employees.

8. *Information*—Furnishing local health authorities currently with information on all matters of health policy and program, new legislation, or regulations, etc., by means of correspondence, bulletins, pamphlets, reports, etc.

9. *General Health Education*—Furnishing local authorities with advice on health educational methods and with materials for health educational purposes, including exhibits, lectures, moving picture films, news items and other matter for publication under local imprint.

10. *Financial Aid*—Providing state funds for the aid of special local health services in emergency, and dispensing such funds according to need.

11. *Administrative Control*—Taking over and operating local health services only when services fail to provide the protection to their communities against the spread of disease which the general health laws or state wide health needs demand.

Coöperation between Municipal Health Departments

Strange as it may seem, the most efficient municipal health departments are generally those of the largest cities whose health problems are the most complex and their solutions most difficult. This is not due solely to the fact that the larger health department

spends more money per capita for health work. There is a certain momentum in health service which can be acquired only by a department dealing with a great mass of people and confronted daily with new situations and new demands for scientific health study. Then, too, because of its more highly specialized activities and the prestige which connection with it gives, the health department of the large city is able to attract to its service a higher type of employee than the small city department. The skilled professional health worker, that is, the one to whom public health service represents a vocation rather than an avocation, is likely to prefer appointment in the service of the larger city department, even though service in the smaller may be less arduous and perhaps more remunerative. Facilities for general and special training in the former are better, contacts with the public and with professional associates are more varied and stimulating, and there is opportunity for scientific research and special study which the small city department cannot offer.

In addition to these advantages for the betterment of the quality of health service, the large department is capable also of giving a greater quantity of service per dollar expended than the small department. Good professional and technical workers employed on full time must be paid substantially the same wherever they are employed. To employ such workers under circumstances which would not permit the community to get full value per dollar of salary expended would probably meet with strong opposition from the taxpayer. For example, every municipal health department needs good laboratory service under the direction of a scientifically trained bacteriologist, but the cost of providing such service in the small city might be prohibitive in view of the relatively small amount of work which would be required and the consequent high unit cost of work performed, even though the health benefits derived might justify such expenditure in the eyes of the health authority. The same is true of many other expert professional and technical services which by reason of their high cost cannot easily be provided in small cities where the volume of work to be done is too small to justify such expenditure, at least in the view of the taxpayer. So it happens that many small communities are obliged to get along as best they may with relatively unskilled personnel and inadequate equipment, or to rely upon the usually unsatisfactory part time employment or voluntary coöperation of

professional workers. In either case, the usual result is that much work which ought to be done is not done.

In a few instances small adjacent cities, which cannot independently maintain the desired health organization and equipment, have found it quite practicable to join forces in the maintenance of a single health department for their combined populations, or to coöperate in the joint maintenance of certain special services such as school health work, laboratory service, food and sanitary inspection, etc. Several of the states have enacted laws designed to make consolidations of this kind effective under state supervision. Relatively few city health departments have, however, taken advantage of their opportunities in this respect, even where their health interests may clearly be better served by such coöperation.

Two illustrations of this type of health organization, representing the combined populations of several adjacent communities are of particular interest to students of health administration. In Massachusetts, Wellesley, Needham, Framingham, Weston, and Belmont united for joint health administration in 1913.[3] In Illinois in 1914, the cities of LaSalle, Peru, and Oglesby united health forces in a single health department serving a combined population of about 25,000. As a result of these consolidations, all communities concerned were provided with a much more efficient service along all lines than had previously existed.

Even where such a general consolidation of municipal health services is not practicable, it is frequently possible for small cities to coöperate for special services of one kind or another to their mutual advantage. In the "five Oranges," a group of small, thriving New Jersey cities, a consolidated milk inspection service was established in order to eliminate duplication of inspection. The coöperative plan resulted not only in improved milk control, but also reduced cost to each community. Several small communities adjacent to Montclair, New Jersey, which has a well organized health department, contract with the latter city for laboratory service on a fee basis and find the arrangement quite satisfactory for all routine laboratory work.

There is no rule with respect to the size of cities, their distance apart, or the nature of their health problems which can be universally applied to determine when, where, and under what circum-

[3] Earl B. Phelps, "An Experiment in Public Health Administration," *American Journal of Public Health,* September, 1913.

stances any type of consolidation of local health services is indicated. It is, however, a matter to which municipal officials may well give serious attention. In almost every state one may observe side by side, several small cities, each maintaining a weak and inefficient health department, which could, if they pooled their resources, maintain a single, strong, well directed health department without undue burden upon any city in the group. In many instances, one finds a great city with a well organized health department which, with very slight expansion, could provide efficient health service for the satellite cities around it, having no health departments worthy the name. Yet, even where the health work of both large and small communities is certain to be improved by the unification of their services, proposals of this kind are rarely acceptable to citizens and officials of the small communities who fear that somehow their own peculiar interests, political or otherwise, will be lost sight of.

In 1914, the writer, at the instance of a citizens' public welfare committee of Essex County, New Jersey, made a study of local health administration in that county with a view to the development of a plan of coöperation between the twenty-one independent health organizations outside of the large city of Newark. The population of Essex County at the time was about 565,000, of which about 370,000 was included in the city of Newark, and about 195,000 in the twenty-one smaller communities which ranged in size from about 500 to 35,000 population. The study showed clearly that, with few exceptions, these small communities were very poorly equipped for health service and incapable of providing it except at a cost which would be higher than their citizens were willing to pay. The New Jersey state law permitted the organization of coöperative health units by neighboring towns and there was no apparent reason why this could not be done to great advantage. It was, therefore, proposed that twenty of the communities combine in the maintenance of three health departments and that one community which was contiguous to the city of Newark join forces for health administration with the latter city. The general features of the proposal were endorsed by the citizens' public welfare committee to which the report was made, but local citizen inertia and partisan political influences, plus the failure of the citizens' committee to press the matter, resulted in no action. The situation remains to-day practically as it was ten years ago, although the growth of population in some of the

small communities and the general strengthening of state supervision of local health departments have contributed to some betterment of their health work.

In order to bring about the adoption of such a coöperative health program as that described, it is essential that the reaction of the small communities against coöperative action shall be met by a thoroughgoing campaign of publicity and citizen education. To carry out such a program there must be some sort of a continuing organization of representative citizens which will put public health before all other issues of the general welfare. The public welfare committee, which was concerned with the problem of local health administration in Essex County, had at the same time to consider many other matters which, at the moment, it regarded as of greater importance to community welfare, and the plan suggested did not therefore receive sufficient publicity to offset the initial local reaction against it.

The Relation of Official and Unofficial Health Agencies

In the last two decades there has been a most extraordinary expansion of unofficial health agencies of all kinds, particularly for the promotion of child health, the prevention of tuberculosis and venereal disease, and the care of the sick of all types. That this great development of voluntary citizen activities for health betterment has helped materially to raise standards of official health service cannot be doubted. It has, however, added somewhat to the difficulties which the health officer encounters in the education of the public to an appreciation of the rôle of the official health organization in community health movement, and the responsibility of citizens for seeing that the official health organization is equipped to play its rôle. In many cities, far more money is being spent by unofficial groups for health promotion than by the official health unit. The result often is that the citizen looks for leadership in health matters to the unofficial health agency or agencies of his community instead of to the official health organization. The health officer cannot, of course, secure his title to leadership merely by insisting upon it as a right. He must be fitted to exercise it and capable of demonstrating his fitness. This means that he must not overlook any opportunity, where the problem of coöperation between official and unofficial health agencies is to be solved, of offering some practical working basis of coöperation which implies not merely occasional contact and chance relationship between

public and private health agencies, but a planned and centrally directed coördination of all agencies for health.

This question of the relation of official and unofficial agencies in any community is one that calls for the most careful analysis. The unofficial health organizations, many of which have traditions of special service and special appeal, are loath to give up what they consider to be their right to self determination. Their very existence, in many instances, depends upon their taking advantage of every new opportunity for an appeal for public support for their special causes. They complain, often justly, of the inadequacy and political domination of official health services and use this as an argument for strengthening their own positions in public favor. On the other hand, health officers are inclined to contemplate the rapid expansion of private or unofficial health agencies with some disfavor because the particular fields of service of the latter, namely, child health promotion, and tuberculosis and venereal disease prevention are the very fields in which the health officer finds his greatest opportunity to arouse public interest and gather public support. The citizen, who sees child health work or tuberculosis prevention carried on by well organized, unofficial agencies, is likely to ask why he should endorse larger appropriations from tax money for similar official purposes as long as private philanthropy appears to be willing to carry the burden.

How coöperative relations between official and unofficial health agencies may best be developed can only be determined by thorough study of existing practice. That there should be a definite organization for community health service which shall give both the official or public health department, and the unofficial or private health agencies proper representation, and that in such organization, the health officer's position as official leader of the combined health enterprise should be fully recognized, are matters of general agreement. The type of organization most suited to local requirements, and the measure of the responsibility for the direction of such organization, which may desirably be vested in the health officer, are not, however, definable by generalizations. In a few cities, the health officer, because of his outstanding capacity for leadership, has been able to secure the complete coöperation of unofficial health agencies without definite organization for the purpose. In others, as in Dayton, Ohio, unofficial health agencies have voluntarily surrendered the direction of certain of their public

health activities to the health officer, while retaining their right to self determination in other matters. In still other cities, the health department and the unofficial agencies have combined for special purposes in one general organization under the direction of a board or committee which is representative of all agencies. But in a great many cities, real coöperation between the health department and the unofficial health agencies is lacking, because there is no general organization of forces to this end.[4]

Health Centers and Health Demonstrations

The health center movement which has been chiefly sponsored by the American Red Cross Society has done much to promote coöperative relations between official and unofficial health agencies.

As conceived by the American Red Cross, a health center is the physical headquarters for the public health work of the community. As such, it is the practical and concrete expression of the interest of the community in the health of its inhabitants. It constitutes a businesslike way of associating health activities, both public and private, under one roof, in daily touch and in complete mutual understanding. The health center thus represents the latest step in the development of community health work, and answers the demand for efficient conservation of effort in bringing together important, but hitherto independent, health campaigns, such as those for the prevention of tuberculosis, venereal diseases, mental diseases, industrial diseases, and above all, the vitally necessary modern effort for the conservation of child life. In turn it offers new possibilities of properly relating these volunteer activities to the official health work of the ctiy, county, state, and federal authorities.[5]

The health center plan, as above outlined, has certainly advanced public health work in every community where it has been tried on its merits, and where proper recognition and support has been given to the official health service in the program. It did not receive as much support from local health authorities as its sponsors hoped, largely because many of the former regarded the plan as an attempt on the part of the unofficial organizations to usurp leadership in community health work. Many health officers felt,

[4] "Relative Functions of Official and Non-official Health Agencies," A Symposium, *American Journal of Public Health,* December, 1920.

[5] American Red Cross, *Health Centers, A Field for Red Cross Activity,* 1916.

and with some justification, that the local health office should be the health center, and that the directing authority should be the health officer. Health centers have, however, been established in many cities, chiefly those of 100,000 population or more, where, naturally, there are greater numbers of unofficial health agencies and correspondingly greater need for coöperative effort. Some of these are under direct municipal control, others under private control, and still others under the control of bodies representing both the official and unofficial agencies.

New York State has been a pioneer in the development of municipal health centers, and the New York State health department has made many valuable suggestions regarding health center construction, organization, equipment, and methods.[6] More than a score of such health centers have been established in cities of the state, large and small. Interest in health center development seems to have reached its climax about 1920, largely as the result of the work of the American Red Cross. At the end of 1920 there were 385 such centers in the cities of the country, and the number has, no doubt, been considerably increased since, although information is lacking on the number established to date. Those of Buffalo, N. Y., and Lynchburg, Virginia, are among the best known of the municipal health centers.

Of the health centers established under private auspices with municipal coöperation, the East Harlem Health Center in New York City is an excellent illustration. This center serves a district of about 100,000 population, and brings together for coöperative effort under one roof more than a score of health and welfare agencies having a general as well as a local interest. This work which has been carried on under the direction of Kenneth D. Widdemer, as the executive officer of a council representing the various coöperating agencies, has been highly successful. The purposes of the organization as described in its literature, are:

1. To demonstrate the methods and the value of the coördination of all health and kindred activities in a defined local area, including about 100,000 people.

2. To demonstrate the methods and the value of a well rounded health program in any one district of the city, such program to be secured through the coördination of agencies already existing and working in the district, and the establishment of such addi-

[6] New York State Department of Health, *Health News*, February, 1919 (Health Center Number).

tional agencies as are needed to make a fairly complete health program for the district, each agency, however, to maintain its complete autonomy within its particular field.[7]

Among other demonstrations of coöperative work, the Framingham, Massachusetts, Health and Tuberculosis Demonstration (1917-1923),[8] the New Haven Health Demonstration (1920-1923),[9] and the New York Health Demonstration now being conducted by the Milbank Foundation in three areas of New York State,[10] are of special interest to the student of public health administration. All of these demonstrations have been financed jointly by official and unofficial health agencies. The Framingham demonstration would, however, have been impossible, except for the financial aid given by the Metropolitan Life Insurance Company which initiated it. The New York state health demonstrations, likewise, have been chiefly supported by the Milbank Foundation, which, in 1924, contributed over $250,000 to these projects. These demonstrations have all been described in great detail by their sponsors, and the reader is referred to their published reports for description of demonstration, organization, and methods.

The New York State demonstrations, which are now in operation, deserve special comment here. The Cattaraugus County demonstration represents an effort to coördinate the health effort of a rural community of about 75,000 population. The Syracuse demonstration has a similar objective in a medium sized industrial city of about 188,000 population. The Bellevue-Yorkville demonstration in New York City serves a typical, highly congested, district of a first class city. These demonstrations, which took active form in 1923 and 1924, have, in the opinion of competent observers, made a decided contribution to the solution of rural and urban health problems. What their ultimate accomplishment may be in raising the standards of official and unofficial health work in the demonstration areas remains to be seen. Undoubtedly they will leave the communities better than they found them, and

[7] Kenneth D. Widdemer, "East Harlem Health Center Demonstration," *Hospital Social Service,* v. 8, pp. 147-152 (1923).

[8] Donald B. Armstrong, *Framingham Monograph No. 10,* General Series, Final Summary Report, July, 1924, National Tuberculosis Association, New York.

[9] Philip S. Platt, *Report on the New Haven Health Demonstration, July, 1920–June, 1923.*

[10] *Milbank Memorial Fund (New York),* Report for the year ended December 31, 1924, with an account of the New York Health Demonstrations.

many new services established through the financial aid of the Milbank Foundation will probably become permanently a part of the official health program of the community. It may be impossible for the people to support fully from their resources all of the special services established, but they will no doubt be willing to support many extensions both of official and unofficial health work which have been shown by the demonstrations to be productive.

The chief danger in coöperative work of this character, which is so largely supported by commercial or philanthropic corporations, is that the support may be so long continued as to put the community in a state of dependency. The effect upon the community of subsidies of this kind is much the same as that upon the able-bodied individual who discovers that it is possible for him to shift responsibility for his maintenance to charitable agencies. Self help is as necessary to the development of strong community character as to the development of strong individual character. In the writer's judgment, many health demonstrations fail to result in permanent health gains because they fail to recognize that, in the main, public health administration must be supported by taxation, and that tax revenues must be distributed among a great variety of other public services which are as essential to public welfare as those directly concerned with health betterment. As in the case of public health, all other services of government are expanding at a tremendous rate; taxes mount higher and higher along with other costs of living. The question to be solved is not alone what program is desirable, but what program is the public able and willing to support in addition to those services which are mandatory.

The fact that the coöperative effort of official and unofficial agencies will produce greater health benefits than the individual, uncoördinated effort of such agencies requires no further demonstration, except with respect to methods or organization and administration of the coöperative plan. That greatly increased health expenditure, assuming wise management of funds, produces increased health benefits in direct proportion is also well known. What is really needed is a demonstration which will show communities what can be done by organized coöperative effort at a cost which the people are able and willing to pay out of their own pockets. It does not seem likely that the ideal of a complete public health program supported wholly by taxation will ever be realized, and perhaps this is as it should be. There will probably always be

need for private contributions to supplement official health work. But the fact should not be lost sight of that the tax supported health service is the cornerstone of the community health edifice. If that does not rest on the firm footing of tax paid public support, the whole health structure will lack stability.

It is imperative, therefore, in planning a demonstration of coöperative health work, than the practical problem of adjusting the health program to the available financial resources of the community be kept in mind. Emphasis should, it is believed, be put upon the development of services which can ultimately be taken over and operated efficiently by the health department. Since the health department is the agency chiefly responsible for the carrying out of the demonstration program, the health officer should have corresponding authority in the direction of the demonstration work. Failure to recognize the health officer's status as the one finally responsible for community health is a fatal defect in any plan for coöperative health effort.

The Advantages of Health Center Coöperation

The term, health center, has been used rather loosely to describe a great variety of institutions designed to furnish health service of one kind or another. It is best used to describe the physical plant in which all possible health promotive services of the community, official and unofficial, come together for coöperative work under central direction, whether that direction be furnished by the health officer of the community or by a director appointed by a control body representing all parties to the coöperative plan. The health services which one would expect to be centered in such a unit and under joint control, are chiefly those which do not depend upon the exercise of police powers; that is to say, those designed to instruct, advise, and aid citizens in personal hygiene. Such activities as the registration of vital statistics, the enforcement of regulations relative to the control of communicable diseases, the protection of the food supply, and the prevention of nuisances are better carried on under the direct and independent control of the official health authority who is held responsible for these activities by law. It is his duty, of course, to encourage the coöperation of all individuals and agencies in law enforcement, but he cannot properly under the law delegate any of his responsibility in these matters to unofficial bodies. On the other hand, such voluntary or nonregulatory activities as the provision of special

advisory and treatment clinics, home visiting by nurses to instruct and aid parents in the care of their children, furnishing information to citizens on all matters relating to the prevention and treatment of sickness, and general health educational services of all kinds can be dealt with most efficiently when all agencies concerned are working in close coöperation and under a central supervisory authority.

The advantages of coöperative work under a health center plan, such as has been described, are chiefly these:

1. By centering all official and unofficial health educational and advisory services under one roof, administrative overhead costs may be reduced through the joint use of equipment, clerical personnel, telephone service, lighting, heating, janitorial service, etc.

2. It is easier for the citizen who wishes health advice and aid to obtain it promptly and according to need at the health center, because the sources of health information and aid are in one place, thereby conserving his own time and that of the agencies serving him.

3. The health center promotes better understanding between the various coöperating agencies with respect to their special activities, permits the prompt "ironing out" of disagreements among them, and furnishes a common meeting ground for discussion of their respective parts in the general health program.

4. The health center furnishes the citizen visible evidence of community health aims and ideals, and gives him a clearer understanding of the many and varied activities which contribute to his own health and happiness, and of his own responsibility for supporting them.

Other Forms of Coöperative Health Work

It is, of course, possible for public and private health agencies to work together coöperatively without any such formal, centrally directed, consolidated organization as has been described. As an aid to such coöperation, the establishment of "community chests" or "welfare unions" deserves consideration. These organizations are primarily designed to eliminate the periodic "drives" for public contributions by many private agencies, and to substitute for these individual "drives," a single annual money raising campaign which will meet the needs of all. The money thus collected is then budgeted and distributed by the community chest directors among the several agencies having membership in the chest. The community

chest procedure is quite comparable to the budget procedure of the city government. The estimates presented by the member agencies of the community chest are reviewed by a budget committee and allotments made according to the needs of the agencies and the funds available.

Since the community chest is responsible for budgeting chest funds, it has a certain though limited responsibility also for determining what its member agencies shall do with their allotments from the budget. This guarantees, to some extent, their coöperation in the common welfare program, and helps to eliminate duplication of service. Usually the community chest establishes a health committee whose business it is to see that duplication and overlapping of work by the member agencies is eliminated. Where this is done, the health authority has opportunity to keep in closer touch with the private health services, and to promote more satisfactory relationships between public and private health forces.

Where the work of private health agencies is not harmonized, as in a community chest or similar organization, coöperation between them and the official health service can be developed through an official or unofficial health council or conference, appointed by the health authority and composed of accredited representatives of the various private agencies and other citizens. This council or conference, though acting only in an advisory capacity, can materially influence public policy by defining the responsibilities of the agencies represented in council, and by laying out a plan that will put and keep each in its proper sphere of service.

In a few cities where administrative boards of health have been abolished and their responsibilities vested in a single officer, the health council, acting as an advisor to the health executive, has been officially recognized as part of the official health organization. In such cases, the head of the city government appoints an official health council which sits in conference with the health officer in determining health policy, drafts health legislation for enactment by the proper legislative body and otherwise functions as a board of health, except that it has no responsibility whatever for executive management. The health officer may consult the health council on executive matters, but responsibility for executive action is his alone. This is of course a quite different situation than exists under a board of health, for the board of health is essentially an executive body, and the health officer has only such executive

authority as may be delegated him by the board. An official advisory health council, such as has been described above, if so chosen as to represent fairly the various organized private health activities of the community, as well as for the health interests of the public at large, would seem to afford all the benefits that could be afforded by an administrative board of health without the many disadvantages of such a board.

Health Surveys

As a means of raising standards of public health work and developing citizen support for health betterments, the health survey has held high place during the past fifteen years. There are few cities of large size which have not been so surveyed, and the results of the surveys have, in the main, justified the survey method. The majority of municipal health surveys have been limited to an examination and appraisal of official health work. Other surveys have dealt with the municipal health service as merely one element of the general health equipment of the community. The latter type of health survey is to be preferred, since it is impossible to obtain a clear view of official health activities without careful study of what is being done by unofficial agencies. Whatever the scope of the health survey, the successful application of the survey method will be contingent upon the following:

1. The establishment of a survey committee which shall represent satisfactorily the various agencies to be surveyed as well as other groups interested in health improvement. This committee should be responsible for preparing the survey program, selecting the survey staff, conducting conferences with the staff during the progress of the work, reviewing and criticizing preliminary and final reports of staff work, and giving publicity to survey findings.

2. The endorsement of the survey plan by all official and unofficial agencies, and their commitment to complete coöperation with those responsible for carrying out the plan.

3. The selection by the survey committee of a person or persons with special skill and experience in the examination and appraisal of health practice, who shall be given full authority to make any and all inquiries regarding the health agencies concerned which may be necessary to the development of the facts desired.

4. The submission by the surveyor or surveyors of their tentative reports to the responsible officers of the various agencies surveyed, so that errors in fact statement may be eliminated before

final publication of reports. Although such officers may not agree with the statements of opinion or the final recommendations of the surveyors, there should be complete agreement with respect to fact findings. The surveyor's interpretation of the facts may be right or wrong, but his unbiased opinion is what is wanted.

5. The publication of the survey report in such form that it may be read by as many citizens as possible. The best report publicity is that which may be obtained by its publication in serial form in the newspapers. Sufficient copies of the report should also be printed for distribution to a selected group of persons who are likely to be of greatest influence in furthering the adoption of the recommendations made.

6. The continuation of the survey committee or the establishment of a permanent committee or other agency to "follow up" the report and coöperate with the agencies concerned in carrying out its recommendations.

The value of such a survey as that described is dependent primarily upon the ability of the surveyor or surveyors to present a thorough, unbiased analysis of the facts with constructive recommendations for improved health organization methods and procedures. To this end, it has been found more satisfactory to employ "outsiders" who have specialized in health survey work and have had experience enough to warrant the confidence of the community in their judgments. It is often argued that the employment of "outsiders" for the work is unnecessary, and that as good or better results can be obtained by surveys carried on under the direction of the health officer or others within the community who are "familiar with local conditions," and, therefore, more competent to appraise such conditions at their true worth. If it were possible to obtain an absolutely unbiased review of health facts in this way, no fault could be found with the argument. But the very familiarity of the health officer or others of the community with local conditions, the personal or political influences which naturally sway them in their judgments, and their reluctance to criticize their own performances, make such a "self survey" undesirable in most instances. The "self survey" by the health officer of his own department or bureau, and the testing of the activities under his own direction by their comparison with recognized standards of practice elsewhere is decidedly worth while. But the health officer is quite often in a position which compels him to tolerate inefficiency, or for expediency's sake, to

adopt a policy which is contrary to his own views of what should be done. As an officer of the government, he may be forced to trim his sail to the prevailing political wind, even though he may be carried on a wrong course. It is frequently of the greatest advantage to him, therefore, to have his department and its relations studied, by one who has no such handicaps to a frank and full revelation of the facts and their unbiased interpretation.

Health officers are sometimes antagonistic to surveys by outsiders because they anticipate adverse criticism. Under such circumstances, it is extremely difficult for the surveyors to make a fair appraisal of the situation. Unless the complete coöperation of the health officer is assured, the health survey is not likely to prove a success. Hence the necessity of committing the health officer to an endorsement of the survey plan at the very start and of giving him full opportunity to review the facts prior to any publication of them. This does not mean that the facts disclosed shall in any instance be suppressed, if they are essential to an appraisal of local conditions, but merely that the health officer be given a fair chance to correct misstatements of fact which might lead to an unwarranted criticism of his policy and program.

The most satisfactory plan of survey of municipal health service is for the city government to employ competent survey specialists for the work and give them absolute freedom to make whatever investigations or inquiries may be necessary for their purposes. With the guarantee of official coöperation which this plan gives, the surveyor has better opportunity to discover the truth. The fact that the city government employs the health specialists, also gives greater assurance that the survey will produce results in health betterment. If there is no result, those officials responsible for spending public money for survey work may have to make some embarrassing explanations to the public. Many a municipal government has suffered political overturn because it has spent public funds for a survey of its work and then "pigeon holed" the survey report.

PART III

THE ORGANIZATION AND ADMINISTRATION OF SICKNESS TREATMENT FUNCTIONS

CHAPTER XVII

THE MUNICIPAL PROGRAM OF SICKNESS CARE

Before attempting to define the limits of the responsibility of the municipal government for the care of the sick, it is well to have clearly in mind the nature and number of the special services which are essential to a well rounded community program, regardless of how responsibility for them may be divided between official and unofficial agencies. First, we may define the sick as of two general classes: (1) those whose disease or disability is such as to require "indoor" or institutional treatment, and (2) those who can be satisfactorily treated as "outdoor" patients either in dispensaries or in their own homes. These two groups may be further classified as follows:

1. Indoor Patients:

a. The acutely ill from diseases and injuries of all types who routine medical and nursing care in a hospital bed.

b. Chronic invalids and the aged infirm who require medical and nursing care and supervision over long periods and under conditions most satisfactorily provided in an institution.

c. Those who suffer impairments of physical or mental functions, which are precedent and predisposing to sickness, and those convalescent from disease or injury who require medical care and supervision which cannot adequately be provided except in special institutions.

2. Outdoor Patients:

a. Those suffering with acute or chronic diseases and injuries of all types and confined at home, who, for one reason or another, cannot be removed to a hospital and must, therefore, be provided with home medical and nursing care.

b. Those whose physical or mental impairment is such as to make confinement at their homes unnecessary and can, therefore, be satisfactorily treated in a dispensary as ambulatory patients.

It is conceded that this is a somewhat arbitrary grouping of the sick, and that the lines of demarcation between these various patient groups cannot always be thus sharply defined, but for purposes of determining what facilities should be available to the sick of any community, the classification will be found useful. Assuming, then, that these various types of patient are recognized, the general and special services required for their treatment are:

1. A general hospital service for the care of the sick and injured requiring routine medical and nursing care under conditions most suitably provided by a hospital.

2. A special hospital service for the isolation of certain communicable disease patients for whom hospital care is necessary for public protection or whose care at home is otherwise undesirable.

3. A special hospital service for selected cases of tuberculosis who require a type of disciplinary medical care and supervision, and an environment not to be had in their own homes.

4. A special hospital service for those chronic invalids and aged infirm who are so incapacitated as to require a type of custodial care and treatment for which their homes are unsuited.

5. A special hospital or sanitorium service for those on the verge of sickness and those convalescing from sickness whose home conditions and environment are not conducive to prevention of sickness or restoration of the convalescent to full health.

6. A home visiting medical and nursing service which will be available as needed by the sick and injured who are confined at home and cannot take advantage of hospital services, or whose circumstances are otherwise, such as to permit satisfactory treatment in their homes.

7. A dispensary or out patient service for ambulatory patients not confined to their homes and not requiring hospital treatment.

No matter what the plan of organization of these services may be and no matter the extent to which each may need to be developed, all are necessary elements of a comprehensive community sickness treatment program. This does not mean that municipal authorities will need to provide all of these various services at public expense, but only that all should be available for community use.

The extremely complex mechanism for the care of the sick is made up of a great number of closely articulated parts. The federal government and the state and county governments have estab-

lished, and maintain at public expense, a great variety of institutions and agencies for the care of the sick which are available to local communities. City governments also maintain at public expense, hospitals, dispensaries, sanatoria, and home visiting treatment services of great variety. Private philanthropic agencies having a local, county, state, or national interest in the care of the sick also maintain agencies and institutions of all kinds for the purpose. Finally, there are the doctors, nurses, and other private practitioners of the healing art whose interest is mainly in the sickness problems of the individual patient. We cannot, in this discussion, do more than touch upon a few of the many contacts and relationships of municipal government in the field of sickness care. Although the sick patient represents a community problem, the method of dealing with him frequently carries the matter far beyond the limits of the local government. It is clear that determination of how the various forces of a city government should be organized to meet the needs of its sick will depend upon what services are available to it at the hands of the national government, state and county governments, private agencies of local or wider interest, and private physicians, nurses, and other practitioners.

Bases of Municipal Responsibility for Treatment of the Sick

With respect to the various services which should be available to every community, as outlined in preceding paragraphs, we shall concern ourselves in this discussion only with those maintained at public expense and for which the municipal government should be responsible. It is possible to conceive a situation in which the entire program might have to be carried on by the city government at public expense, and it may be that in the not too distant future, the care and treatment of the sick of all classes will be regarded in much the same way as education; that is, as a tax supported service for all regardless of their economic circumstances. We have not yet reached this stage, although there is evidence of a trend toward the broadening of the sphere of government in dealing with these and related health problems, through transferring to government much of the responsibility which hitherto has been regarded as belonging exclusively to individuals and to private agencies.

It is impossible to lay down any hard and fast rules with respect to public administration of the care of the sick. Not all cities

have the same conception of their responsibilities in the matter, nor do they have the same obligations and authority under their state laws. In general, however, we may say that the minimum responsibility of the municipal government is to provide for the care of the sick poor, that is "public charges," and for such patients suffering with diseases "dangerous to public health," whether public charges or not, as proper municipal control of these diseases may require. The city government may, of course, go much further than this, which is admittedly a narrow view of its responsibility. Indeed, it is now quite generally conceded that the municipal government ought, as a matter of public policy, to provide for the care of many of the sick who though not dependents are, nevertheless, incapable of meeting the cost of illness without aid from some source. How best to deal with the sickness problems of these people is a question of prime health importance. They are not properly to be regarded as public charges, and sound social policy requires that they shall not be dealt with as public charges. They are, ordinarily, averse to accepting public relief, and since they are not paupers in the legal sense, they are not commonly considered as eligible for public relief. To meet their sickness needs, special services have been made available by private philanthropic agencies, either free or at nominal charges within their ability to pay. But in general hospitals of high standard, it is rarely possible to furnish service at a cost of less than $4 per patient day, except under the most favorable circumstances. If service is provided at rates lower than cost, the private hospital, unless heavily endowed, must either charge some patients much higher rates, or solicit special contributions from private individuals or public authorities to meet the deficits incurred through furnishing service at less than cost. So, in most instances, the cost of the care of part dependent sick must be carried by the community either as a tax burden or as a voluntary contribution.

Recognizing the fact that this burden of caring for many of the sick who are partly dependent must be borne by the community in one way or another, the question of how responsibility should be divided between official and unofficial agencies comes immediately to the fore. Opinion is sharply divided on the subject, but from such evidence as is available, it would appear that the trend is decidedly toward the development of public hospital services (that is, those maintained from public funds), so that the needs of patients who can afford to pay only small amounts for their care,

as well as those who can pay nothing, can be more adequately met. Many large municipal hospitals are now providing not only free service for those who are properly "public charges," but also a pay or part-pay service for those who are able and willing to pay something.[1]

All things considered, it would appear that municipal government ought, in the future, to bear a larger share of the burden of caring for the sick than it has in the past. In this connection, the plan which has been adopted by the Dominion of Canada is of interest. Under an act of the dominion government, hospital districts may be established in the various provinces, and taxes levied against the property owners of the district for the construction and maintenance of hospitals. Every sick person of the community is entitled to care in the hospital, and the costs of his care are made a charge against the municipality, and included in making up the general tax rate. No distinction is made between patients as to their ability to pay; all stand on the same footing, and all persons of the community contribute not on a basis of their use of hospital facilities, but on the basis of their ability to pay as represented by their tax assessments. Here we have an example of a plan for the treatment of the sick that places this obligation of the community in the same category with education, namely, as a public service to be available to all without discrimination, and to be paid for not by the individual directly, but by the community through taxation.

It must not be understood that the writer advocates the general adoption in American cities of any such plan as has been put into effect in some of the Canadian provinces. In Saskatchewan, where the hospital plan described has been extensively developed, and in some other provinces of Canada, there is of course quite a different situation than prevails in American cities generally. The provinces are for the most part sparsely settled, private philanthropy is relatively unorganized, and private medical service is less readily available to the people. The government must, therefore, accept a larger responsibility for meeting the sickness of its people than is necessary in most urban communities. But there are undoubtedly many parts of this country where the adoption of some such plan is worthy of serious consideration.

When we consider the special problem of care and treatment

[1] "Should Municipal and County Hospitals Be Wholly Free," *The Modern Hospital,* October, 1925.

of those suffering with "diseases dangerous to public health," that is, those readily communicable, the responsibility of the city government may be more clearly defined. In every community there are many sick from communicable diseases, who, in the interest of the public health, must be cared for in an institution, and kept under strict control during the period of communicability of the disease. This means that the city government ought not only to be responsible for paying for such service, but that it should, as a rule, have complete control of it. For the general care of the sick, it may be expedient for the city government to depend upon agencies and institutions under other governmental or private control, but for the care of those with diseases of a readily communicable type, the city government cannot afford to shift responsibility to private agencies. It may be desirable for the city government to coöperate with other local districts in the maintenance of a county hospital for communicable diseases, but it is generally unsatisfactory for local government to depend for such service upon unofficial agencies. The aim of the city government, in hospitalization of communicable diseases, is not primarily the cure of the individual patients, important though that is, but rather the control of the patient so that he cannot transmit the disease to others—in other words, the prevention of disease. Since local government is under the law charged with the duty of controlling communicable disease, institutions and agencies for such purpose are properly to be established and maintained by it at public expense.

To what extent the city government should be responsible for maintaining special services for other types of patients, as chronic invalids, the aged infirm, convalescents, undernourished children, can only be determined by careful study of the local situation. If suitable facilities for such patients are available through other sources, the city government's responsibility may well be limited merely to such contributions from public funds as represent the use made of these agencies by the city government. If such facilities are not available otherwise, then the city government should make provision for them under municipal support and control.

Financial Control of Municipal Care of the Sick

To sum up the argument as to the part which the government should play in dealing with the problem of the sick, the questions of prime importance are not what agencies and institutions should

be established and maintained by the city government, but rather (1) what services should the municipal government support out of public funds? and (2) how should it guarantee proper expenditure of public funds for the purpose? In answer to the first question, it is clear that sound public policy requires that the city government shall be financially responsible for the following:

1. The cost of the care and treatment of all sick poor, that is, "public charges," who are unable to pay anything for such service.

2. The cost of the care and treatment of such patients suffering with "diseases dangerous to public health" as must, in the interest of public protection, be isolated in a hospital.

3. Such part of the cost of the care and treatment of other sick persons as is represented by the difference between what the patient can pay and the cost of the service furnished.

If we may assume that these represent proper and legitimate uses of public funds, regardless of whether the services named are provided by government or by agencies outside of government, we may answer the second question as to the method of controlling the expenditure of public funds as follows:

1. The city government should maintain, at its own expense, a well organized and competently directed agency which alone shall be responsible for the supervision of all services for the care and treatment of the sick which are supported by public funds.

2. All appropriations for the care and treatment of the sick should be made to such public supervisory agency for expenditure according to such plan as may have previously been approved by the appropriating authority.

3. No expenditures should be made by such supervising agency except according to the plan approved by the appropriating body, and then only after adequate investigation to determine the propriety of it, and the legal responsibility and liability of the city government in the matter.

4. No services offered by private agencies for the care and treatment of the sick should be made use of by the city government except they be of a standard approved by the supervisory agency of the city government.

5. Where the services of private agencies are utilized by the city government, the relation between them and their mutual responsibilities should be clearly set forth in an agreement or contract; such agreement or contract to provide for payment by the city for the service furnished by the private agency at a rate that

adequately represents the value of the service. Lump sum appropriations by the city government for the use of private agencies should not be encouraged.

Subsidies to Private Agencies

On the last of these recommendations, further discussion is warranted. The common practice in American cities is for the city government to make appropriations of public funds directly to private agencies and institutions whose services are regarded as promotive of community health and welfare. Although, in many instances, these appropriations are merely nominal sums which represent only the recognition by the city government of its sympathetic interest in the work of the private philanthropies, there are many instances in which private agencies have been able to draw from the public treasury sums out of all proportion to the value of their contributions to the public welfare. Many times the subsidies granted private agencies by the city government have resulted in the perpetuation of agencies and social theories which ought to have been discontinued. There are, on the other hand, as many instances of private agencies failing to receive from the city government the support to which their services for government warrant. So to avoid both extravagance in the use of public money and an abuse of private philanthropy, many cities have found it desirable to put their relations with the private agencies on a more businesslike basis. The unit cost of the service furnished by the private agency is determined and the city pays for as many service units as it uses. This protects both the taxpayer and those who support the private philanthropy.

The following excerpts are illustrative of common but faulty practice in the use of public funds for the support of private agencies.

The city of Camden, New Jersey, appropriated for charitable purposes the following sums in 1923:

City Bureau of Charities	$7,500
Cooper Hospital	25,000
Homeopathic Hospital	25,000
Camden City Dispensary	2,000
Camden Free Dental Clinic	2,000
Camden Day Nursery	200

Camden Home for Friendless Children	$ 2,500
Society for the Prevention of Cruelty to Children	1,250
Society for the Prevention of Cruelty to Animals	750
Visiting Nurse Society	3,000
Tuberculosis Society	1,250
Total	$70,450

With the exception of the appropriation made to the official bureau of charities, there is no satisfactory control of the expenditures of the sums allotted these other agencies which are all under private management. Appropriations are in lump sums which are drawn upon as required by the agencies concerned. Under an ordinance, the overseer of the poor, who is the director of the official bureau of charities, is supposed to have "supervision of all charities supported wholly or in part from funds appropriated and paid from the treasury of the city of Camden, excepting the hospitals of the said city and such other charities as the city council may direct." Since the hospitals only have been exempted from such supervision, it is clear that the overseer of the poor has no control whatever of the $50,000 appropriated for the use of the hospitals. With respect to other agencies, his supervision is, in fact, merely a nominal one, since he cannot control the expenditures of public funds allotted to these agencies. As a matter of fact, he has little information about their services, receives no adequate reports from them, and, in so far as their policies are concerned, he has nothing to say. The ordinance is practically a dead letter, even in its application to services other than those furnished by the hospitals.[2]

The following appropriations to private institutions and organizations within the city (Richmond, Virginia) were allowed by the appropriation ordinance for 1917:

1.	St. Monica's Mission	$200
2.	St. Paul's Church Home	300
3.	Retreat for the Sick	500
4.	Eye and Ear Infirmary	500
5.	Belle Bryan Nursery and Kindergarten	500
6.	Female Humane Association	300
7.	Foundling Home	400

[2] New York Bureau of Municipal Research, *Report on Administrative Survey of Camden, New Jersey,* 1923 (typewritten), Memorandum No. 3, Department of Public Affairs, pp. 28.

8.	St. Joseph's Orphan Asylum	$ 300
9.	Sheltering Arms	2,500
10.	Home for Incurables	1,000
11.	Home for Needy Confederate Women	250
12.	Richmond Colored Hospital	200
13.	Spring Street Home	800
14.	Little Sisters of the Poor	500
15.	Friends' Orphan Asylum	150
16.	St. Joseph's Mission House	500
17.	Instructive Nurses' Association	1,000
18.	Nurses' Settlement	800
19.	Society Prevention of Cruelty to Animals	500
20.	Children's Home Society	300
21.	Richmond Male Orphan Asylum	500
22.	Colored Orphan Asylum	250
23.	Old Folks' Home	200
24.	Travelers' Aid Society	750
	Total	$13,200

Although the city of Richmond spends annually for its private institutions $13,200, it has little or no information from the institutions as to the character of work done, results obtained, costs of service, etc. The meager reports which are submitted by them to the state board of charities and corrections are quite inadequate as a basis for determining their need for public support or even the need for their existence. It was stated by the city auditor that the amounts given to homes and hospitals are intended chiefly to cover the cost of light, water, etc., which, under the law, the city is not allowed to furnish free. As to other organizations and institutions, the theory is that they relieve the city of the burden of caring for certain of its poor. It is possible that many, perhaps all, of these institutions are doing commendable work, but the city government now has no way of knowing what they are doing other than by hearsay, or the review of the reports made to the state board of charities and corrections.

Requests for funds are commonly made by the authorities of these institutions by letter or by personal appearance before the finance committee of council. It appears from the records that the amounts to be allowed are largely established by precedent rather than on the basis of careful investigation of their needs or the services which they render to the city.

The city now maintains, at considerable expense, a home for the care of the sick and infirm poor, including tuberculosis pavilions for colored persons, the Virginia Hospital for the acutely ill, both white

and colored, and the Pine Camp Hospital for white tuberculosis patients. That these services do not meet all the demands for the care of needy persons is quite true, and the city's service must, of course, be supplemented by private endeavor. As a matter of policy, however, the subsidizing of private institutions should not be encouraged. It is right and proper that the city should pay for actual service rendered, and this should be its policy under the organization of a department of health and charities, as previously recommended. All applications for relief of the poor of whatever nature should be referred to the head of that department. From such sources as are available, as the Associated Charities and other charitable organizations, the city's responsibility for the care of individuals should be determined and the city should pay for such service as may be found advisable.

In many states and cities the subsidizing of private agencies is forbidden by law, and this, it is believed, is not only good business but sound public policy. It is recommended, therefore, that donations to private institutions be discontinued, and payments made only on the basis of actual service rendered. In the care of institutions to which public charges are referred, the city should pay an amount per day or per week, based on the actual cost of maintenance in such institutions; in the case of the service rendered by the Visiting Nurses' Association, the Social Settlement and the Travelers' Aid Society, payment should be made for actual service, approved by the proposed commissioner of charities, and on the basis of bills rendered by these organizations. Attendance by visiting nurses upon city charges should be paid for at a fixed fee per visit.

If the discontinuance of the small subsidies granted by the city results in the elimination of certain small impoverished institutions, it will probably be a distinct gain in that it will place squarely before the city authorities the necessity of providing adequate and proper care of all of its charges in such a manner that the appropriation granting authority will also have administrative as well as financial control.[3]

Although each of the two private contagious disease hospitals is practically dependent for its maintenance upon the grants made by the city and would doubtless be put into financial straits by the denial of these grants, it is believed that the present plan of subsidy is extravagant. It is desirable, of course, to isolate in a hospital as many cases of diphtheria and scarlet fever as is possible, but for the city to continue the present program at an annual outlay of approximately

[3] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Richmond, Virginia,* 1917 (printed), pp. 637, 644-646.

$85,000, without acquiring any permanent interest in these institutions, is not believed to be good policy. The city needs a municipal contagious disease hospital or pavilions, which may be under its own control, built according to modern ideas of contagious disease hospital construction and properly equipped to provide for the treatment of all cases which may be proper charges of the city, and such other cases as may, in the opinion of the medical officer of health, require hospital isolation. Such a contagious disease hospital should be a part of a large general municipal hospital, and should provide also for adequate care of smallpox patients.

If the present plan of utilizing the services of the Alexandra and St. Paul hospitals is continued, they should be paid for their services at a fixed per diem rate for each patient. The city should pay for service actually rendered rather than grant lump sum subventions to these institutions. If this is done, no case should be admitted to the hospital without the approval of one of the examining physicians of the health department. As it is now, any physician may send a patient to the hospital on his own responsibility and the city must foot the bill. There is too much opportunity for abuse of this privilege, even though it may be desirable to hospitalize the majority of patients with contagious disease. As a matter of fact, however, the financial status of the family, and the home conditions of the patient should be guiding factors in determining whether or not a child is to be cared for at the city's expense. If the family is able and willing to provide proper home care, and if conditions in the home are such that effective isolation may be provided under the supervision of a physician, the patient will be, in many instances, as well off at home. It should be the duty of the examining physicians to determine these facts.

What the city should pay for the care of patients in these private hospitals should depend largely upon the patient day cost in each institution. At the present time, the patient day cost for all patients at the Alexandria Hospital is said to be $2.38, and at the St. Paul Hospital $2.26. As these hospitals are private hospitals, it was not considered within the scope of this survey to make a careful study of the factors contributing to these costs, and therein lies the chief criticism of the present plan. The city supports these two hospitals, but has nothing to say as to their administration, the organization of the staff, the dietary, methods of treatments, etc. It has no way of determining, other than by the observation of the superintendent of the division of contagious diseases, whether the hospitals are economically operated or not, and even if it knew that they were not economically operated, it would have no power to change conditions.[4]

[4] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Montreal, Canada,* 1918 (typewritten), pp. 1222-1224.

Principles of Organization of Municipal Sickness Treatment Services

In an early chapter, a plan was suggested for the coördination of sickness prevention, sickness treatment, and other health and welfare services of government in a single general department of public welfare. But whether or not the grouping of related service units in such a general department is possible and practicable in view of existing charter or other limitations, there are two principles which are applicable everywhere to the administration public agencies and institutions for the care of the sick. These are:

1. Such institutions and agencies should, as far as possible, be brought under single headed, centralized management in order that all elements may be properly integrated in one general plan, and without conflicts of authority and responsibility for their financial management.

2. Since the general hospital for the acutely ill and injured is the basic unit of the program, all other special services for the care of the sick should, as far as possible, be developed and maintained as units of the general hospital service.

To make clear just how these principles would be applied, let us assume for the moment that the city government maintains, under its own auspices, all of the various services which we have considered as essential to a complete program of indoor and outdoor care and treatment of the sick, including as indoor services a general hospital, and a hospital for communicable diseases, a tuberculosis sanatorium, a convalescent hospital, and a hospital for chronic invalids and the aged and infirm; and as outdoor services, a dispensary and home visiting medical and nursing service. If it were possible to bring together in a single hospital plant all of the various services named, this would be best from the standpoint of management since many special activities common to all could be performed more efficiently and economically by a common staff unit or units, as accounting and record keeping, dietary, stores keeping, operation of plant utilities, etc. But this is rarely practicable without disregarding the adaptation of location and environment to the special needs of patients and medical attendants. It is, however, possible and practicable to centralize administrative control of all services for sickness care, so that the disadvantages in management resulting

from the necessary physical separation of service units can, in a measure, be overcome and, at the same time, permit the various units to enjoy all of the advantages of location and environment suited to their particular needs. The hospital system thus conceived represents a collection of service units, each of which has its special part in the general program, and though each may be under separate direction, all are under central management and control.

The General Hospital

Since the emergency care of the acutely sick and injured is the most pressing need and the one calling for the most highly specialized type of organization and service, the general hospital for emergency treatment of patients constitutes the primary major unit of the hospital system. The general hospital should contain the following elements:

1. Pavilions or wards for the care of the injured and acutely ill from noncommunicable diseases or from communicable diseases not requiring isolation.
2. Pavilions or wards for those communicable disease patients who must be kept in isolation.
3. An out patient department or dispensary with the necessary special clinics to provide for the care of ambulatory patients attending at clinics, and through a home visiting medical and nursing service for those patients who are confined in their homes.

These three elements of the general hospital can best be dealt with as a single physical unit, under the direction of a superintendent responsible to the central controlling authority. The isolation hospital functions best when it is in close relation to the general hospital service, since the highly specialized organization and equipment necessary to the latter can be utilized to advantage in the special work of caring for isolation patients. It is of considerable advantage also, when the general hospital maintains a training school for nurses, to have the isolation hospital service closely connected in order that nurses in training may be taught the procedure of care of communicable diseases. The nurse who completes hospital training without having had experience in the management of isolation of communicable disease patients is sadly handicapped for her future work.

The out patient service should always be a part of the general hospital service where this is possible, in order that the professional

and technical personnel and equipment necessary to hospital service can be utilized in the dispensary. The out patient dispensary conducted as a part of the general hospital service also contributes to the efficiency of the latter by serving as a clearing house for patients seeking hospital admission, and as a "follow up" agency for those discharged from hospital beds. Many patients who seek hospital admission may be found suitable for outdoor care in the dispensary and may be so cared for to their own advantage and to the advantage of the hospital. Many patients may be discharged from the hospital earlier where there is an efficient dispensary to which they may return as ambulatory patients for further treatment. In other words, the efficient dispensary helps materially to reduce the burden of hospital maintenance by reducing the number of patients who would necessarily have to be cared for in the hospital if no out patient treatment services were available.

Other Units of the Hospital System

The second major unit of the hospital system is the tuberculosis hospital. As a rule, this unit cannot be brought into close physical relation with the general hospital, although this is desirable. The chief problem in the hospital care of the tuberculous is that of providing an environment for the patient which will permit him to take full advantage of outdoor rest, recreation, sunshine and fresh air, and promote his general mental and physical up-building. These benefits cannot easily be furnished the tuberculous patient in the environment of the general hospital which in most instances must, for best service, be situated close to the center of the population to be served. If the general hospital is so situated that it may provide proper environment for tuberculous patients, it would of course, be an advantage to include the tuberculosis unit in the general hospital plan.

Except in the larger cities, municipal hospital care of the tuberculous is limited mainly to the care of far advanced cases who are confined to their beds and require routine medical and nursing care, such as can best be provided in general hospital wards. Care of the incipient and moderately advanced cases of tuberculosis is provided in most states by county and state sanatoria situated in suitable rural environments. As a general thing it is not desirable to attempt the care of both the far advanced and the incipient or moderately advanced cases of tuberculosis in the same place. This is frequently done, but the mingling of the hopelessly sick tuber-

culous patients with those whose cure is probable does not make either for good administration of the institution, or good patient morale. The tuberculosis hospital unit, whether in close proximity to other hospital units or not, is preferably placed under the direction of a superintendent who is especially skilled in the management of tuberculous patients and responsible directly to the controlling authority of the hospital system.

What has been said of the tuberculosis hospital unit applies as well to the hospital units for the care of the chronic invalids and aged infirm, and for convalescents. The needs of patients of these two classes can best be served where they are cared for in hospitals which are separate from the general hospital unit and in a location and environment better adapted to the general welfare of patients than can usually be provided in connection with the general hospital. The cost also of caring for such patients in general hospitals is much greater than that of caring for them in special hospitals. As already noted, the cost per patient day for general hospital care is rarely less than $4, whereas chronic invalids, aged infirm, and convalescents can be suitably cared for in special institutions at little more than half this patient day cost. In the hospitals for the latter types of patient, the necessary equipment is much less expensive than in the general hospital, medical and nursing attendance need not be so highly specialized, the numbers of professional attendants per unit of patient population need not be so great, and general overhead costs may be considerably reduced.

Relatively few municipal governments maintain special hospitals for chronic invalids and aged infirm. Such patients, if dependent, are usually cared for in an infirmary of a county almshouse or in a county hospital. Other patients of this type, if provided for at all, are admitted to general hospitals either under municipal or private management, and cared for along with the more acutely ill. This is, however, a decidedly uneconomic procedure, for reasons already noted, and particularly when there is a shortage of general hospital beds for the acutely ill. The chronic invalid or aged infirm person who is cared for in the general hospital, say for three months, occupies space which might be utilized for the care of perhaps a half dozen more acutely sick people.

Convalescent hospitals also are only rarely maintained by municipal governments, although such institutions in cities of 100,000 population or more would undoubtedly contribute greatly to community health. There are many persons in all cities whose serious

illness may be prevented by giving them opportunity to recover health and strength under medical supervision in a suitable institution. There are many recovering from illness whose recovery may be hastened and relapse or recurrence of sickness prevented by institutional care of this kind. What has been said of the care of chronic invalids and aged infirm in the general hospital applies also to convalescents. The general hospital ward is not a suitable place for these patients, because its atmosphere and environment is not adapted to their general welfare needs. In order to keep general hospital beds free for the more acutely sick, it is desirable to discharge the convalescent as soon as his condition permits. If it is necessary for him to return to his own home, it is frequently impossible to provide conditions there suitable to his full recovery of physical and mental vigor. Patients who have had serious operations or long exhausting illnesses of any kind ordinarily need from ten days to two weeks or more of supervisory care with respect to rest, recreation, dietary, and freedom from mental strain and stress, which can rarely be provided satisfactorily except in the convalescent hospital.

Most of the convalescent hospitals or homes now established are under the management and control of private agencies. Among the best of such private institutions is that maintained by the Winifred Masterson Burke Relief Foundation at White Plains, New York, under the medical direction of Frederic Brush.[5] This institution is one of several under private control serving New York City. Dr. Brush estimates that of the total of about 10,000 beds for convalescents in the entire country, approximately one-half of them are utilized by New York City, although many of the hospitals or homes so utilized are in neighboring states. This indicates how inadequate exisiting facilities of this kind are for most of our large cities.

Advantages of Central Control of Hospital Units

It can be readily seen that where such a hospital system brings together in one location all of these various units, economies can be made in plant operation which would be impossible otherwise. Even when the units of the system are widely separated, as would necessarily be the case in most cities maintaining some or all of the services described, there are many economies possible, provided

[5] Winifred Masterson Burke Relief Foundation, New York, *Directory of Convalescent Homes in the United States,* also *Sixth Report,* 1923-1925.

only where there is central control and an integration of all units in a common administrative program. Under divided control, it is extremely difficult to secure a properly balanced budget for sickness care. Each institution, if independent, is likely, almost certain, to present a special plea for funds for its own purposes regardless of the budget program as a whole or the needs of other related agencies. The result is that in the conflict of special interests the general interests of the community may be lost sight of by the appropriating body, and uneconomic allotments of public funds fostered. Under central control, on the other hand, the controlling authority will be responsible for determining the needs of each institution, and for preparing estimates which will give each institution its proper place in the financial program. The advantages of such procedure are apparent.

Central control promotes economy in the use of public funds for special institutional purposes. For example, there are many overhead activities which are common to all, and can be carried on more satisfactorily and economically in a central office than in several local offices, such as the selection and control of personnel, purchasing and distribution of stores, the standardization of records and reports, publicity and public information, etc. In other phases of institutional work also, there are opportunities for economy in plant operation under central administration. Movable plant equipment required at times by all units of the system can be used in common; personnel can be shifted from one unit to another as occasion requires; in emergency, such as an epidemic or catastrophe, all possible facilities of the hospital system can be utilized to meet the emergency situation with the least possible delay, and at the least possible cost.

It would be possible to secure these advantages even where institutions and agencies were under independent management, provided there could be assurance of coöperation between their managing authorities. But coöperation between independent agencies of government rarely, if ever, means more than a mere exchange of formalities between them, because the heads of the agencies supposed to coöperate have, as a rule, quite different conceptions of the relative importance of the services concerned, and frequently quite different interests. Certainly, in the treatment of the sick by municipal government, coöperation is a poor substitute for coördination and the central management which that implies. There is one common aim of all public services for the sick, namely, the

wisest and most economic use of public funds in the interests of the community health and welfare. The city government may need a great variety of counsel as to how this purpose may best be met, but once it has determined how it should be met, the management of the program should be entrusted to the fewest possible officials, preferably to one.

An Outline of the General Organization of the Hospital System

There should be one administrative authority responsible for all units of the hospital system. If the hospital system represents an independent department of government, that authority may be a board or a single administrative officer directly responsible to the head of the city government. If the hospital system is merely a bureau or a division of a general department of welfare, department of health, or department of charities, the administrative authority will be the head of such department. If the administrative authority of the hospital system has under its control several hospital units, all units may be under the direction of a single general superintendent with assistant superintendents in charge of the various special units, or there may be a superintendent for each unit whose responsibility to the administrative authority of the hospital system is direct. Since the general hospital is the major unit of the hospital system and its efficient operation and maintenance is largely dependent upon the coördinate functioning of other units, it is desirable that the executive officer or superintendent of the general hospital unit shall be the chief executive of the system, and that executives in charge of other units shall be responsible to the central administrative authority through this chief executive rather than directly.

Where the hospital system is established as an independent department of the city government, it may not be necessary to have any authority intervening between the general superintendent of the hospital system and the head of the city government. As a rule, however, where the number and character of the special units of the hospital system warrants setting up an independent hospital department, that is, chiefly in the largest cities, it is usually desirable not to combine general administrative control and managerial direction. In such case, the administrative authority should be a hospital board or, preferably, a hospital commissioner, to whom the general superintendent would be responsible for technical management of the system.

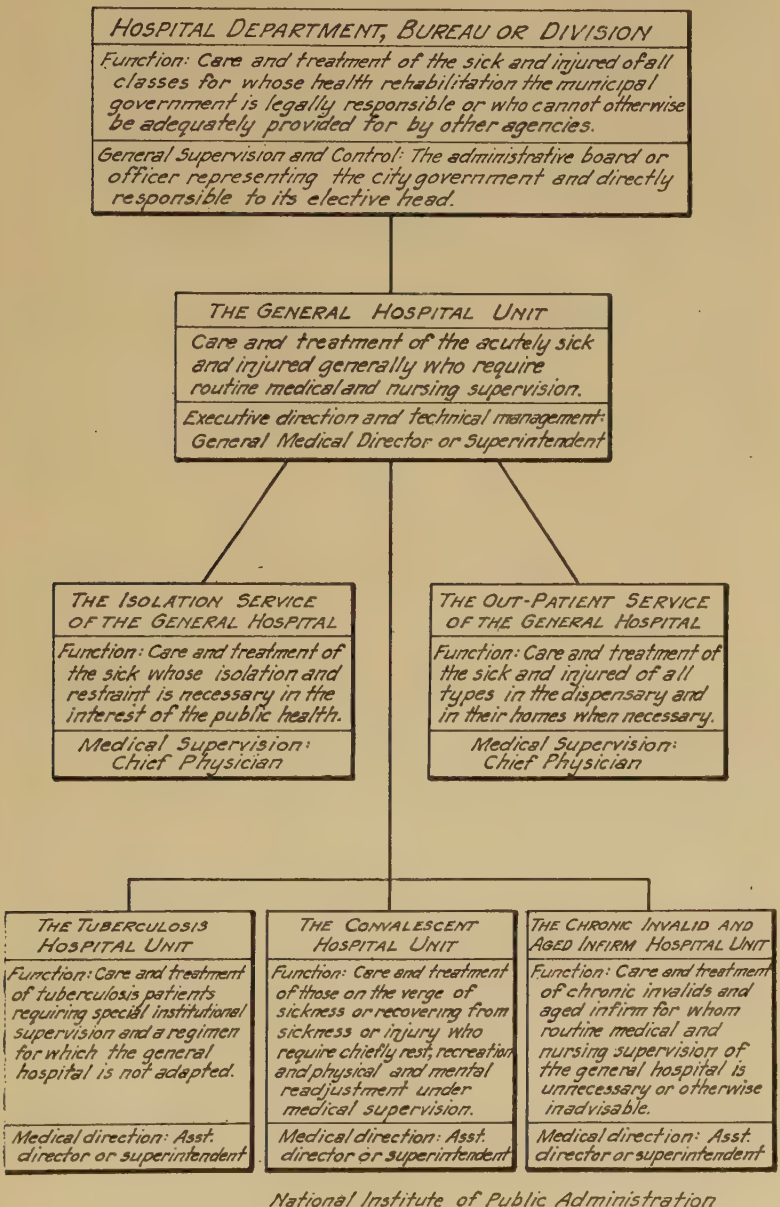
The accompanying chart illustrates the form of an organization such as has been described.

Handicaps to Central Management of Treatment Services

The hospital system illustrated is to be regarded as representing rather an ideal than a condition of actual municipal practice. The writer has not, as yet, seen a sickness treatment service of municipal government which even approximates this ideal. We find in actual practice that municipal systems for the care of the sick are commonly not systems at all, but rather mere aggregations of more or less independently managed units. The general hospital service may be administered as a charity hospital under the management of a poor department; it may be administered by a health department, or it may be entirely independent of either. The isolation hospital is commonly not a part of a general hospital service, if there be one, but independent and under the management of the health officer. This is because of the traditional fear of communicable diseases and the origin of the isolation hospital as a smallpox pesthouse. The dispensary service is sometimes a part of the general hospital, and sometimes it is an independent unit under separate management. If there is a tuberculosis hospital, it is usually independently managed and controlled. The same is true of convalescent hospitals where these are maintained by city governments. The hospital for chronic invalids and the aged infirm is usually a branch of an almshouse or home for indigents, perhaps under the control of municipal poor authorities or independent. All sorts of variations are found in practice, and it cannot be said with respect to any of the institutions named that there is any common understanding of their proper place in the general organization of welfare activities or of their relation one to another.

The establishment of services for the care of the sick by municipal governments and their coördination in a common program has proceeded like most other public services, haphazardly. Frequent changes of administration of city governments have hampered the adoption and prosecution of any carefully thought out plan. Traditional concepts of the rôle of the city government in the care of the sick have had their effect in dividing responsibility. Needs that should have been met by municipal governments have not been met by them, and private agencies have had to step into the breach. When the municipal government "takes

THE GENERAL ORGANIZATION AND FUNCTIONS OF AN IDEAL MUNICIPAL HOSPITAL SYSTEM


HOSPITAL DEPARTMENT, BUREAU OR DIVISION
Function: Care and treatment of the sick and injured of all classes for whose health rehabilitation the municipal government is legally responsible or who cannot otherwise be adequately provided for by other agencies.
General Supervision and Control: The administrative board or officer representing the city government and directly responsible to its elective head.
THE GENERAL HOSPITAL UNIT
Care and treatment of the acutely sick and injured generally who require routine medical and nursing supervision.
Executive direction and technical management: General Medical Director or Superintendent
THE ISOLATION SERVICE OF THE GENERAL HOSPITAL
Function: Care and treatment of the sick whose isolation and restraint is necessary in the interest of the public health.
Medical Supervision: Chief Physician
THE OUT-PATIENT SERVICE OF THE GENERAL HOSPITAL
Function: Care and treatment of the sick and injured of all types in the dispensary and in their homes when necessary.
Medical Supervision: Chief Physician
THE TUBERCULOSIS HOSPITAL UNIT
Function: Care and treatment of tuberculosis patients requiring special institutional supervision and a regimen for which the general hospital is not adapted.
Medical direction: Asst. director or superintendent
THE CONVALESCENT HOSPITAL UNIT
Function: Care and treatment of those on the verge of sickness or recovering from sickness or injury who require chiefly rest, recreation and physical and mental readjustment under medical supervision.
Medical direction: Asst. director or superintendent
THE CHRONIC INVALID AND AGED INFIRM HOSPITAL UNIT
Function: Care and treatment of chronic invalids and aged infirm for whom routine medical and nursing supervision of the general hospital is unnecessary or otherwise inadvisable.
Medical direction: Asst. director or superintendent

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over," as it often does, special services originally established by private agencies, the tendency is to continue the scheme of management already fixed by the latter. Where municipal governments have established new services for the care of the sick, the pressure has almost invariably been to create new boards, commissions, or other authorities to administer them, although they might well be placed under the control of authorities already existing. Groups of citizens interested in the promotion of a special service for public welfare are inclined to feel that their purposes can best be served by a new agency in the field. City charters, which were enacted when municipal care of the sick was limited mainly by the almshouse infirmary, and the smallpox pesthouse, may still be in effect and, consequently, not adapted to modern concepts of coördinated, purposeful health service. City ordinances enacted at various times and under various impulses, political or otherwise, though in theory easily revised to suit changing conditions, are not in practice easily revised, if their change disadvantageously affects the number or nature of political appointments, or disturbs the vested interests of official and unofficial groups.

These are all practical considerations which have to be dealt with on their merits. Nevertheless, the difficulties which may be encountered in an attempt to coördinate the sickness treatment services of government are none of them insurmountable. The benefits to the community as a whole which may be enjoyed through betterment of services for the care of the sick are great enough to warrant even complete reorganization of the city government. It should not be necessary to wait for the catastrophe of an epidemic such as that of the influenza epidemic of 1918, when cities all over the country found themselves in dire straits, because their institutions for treatment of the sick were utterly inadequate to serve the common need, both in their capacity and in their organization.

CHAPTER XVIII

HOSPITAL MANAGEMENT, ORGANIZATION, AND FUNCTIONS

The management of a public hospital is quite a different thing from that of a private hospital although precisely the same functions may be performed by each. In a private hospital it is essential that there be a special agency as a board of managers in which trusteeship is vested by law. In the public hospital there is no need for such a body, since trusteeship is vested in the government itself. This is not to say that public hospitals do not have boards of managers or trustees. In the older forms of city government, where board administration of public services is still favored, public hospitals are usually managed by boards; in governments of the commission or the manager type, where effort has been made to bring about more direct and centralized control of public services, hospital boards are not as frequently found.

Where board of trustees or managers of public hospitals do exist, responsibility for routine management is delegated in the main to a superintendent who is an appointee of the board. Final authority for the selection and disciplinary control of personnel and for general hospital policy and program is, however, retained by the board, and the superintendent acts in these matters merely as an executive officer of the board. Where no board of trustees exists, the superintendent is appointed by the head of the city government, or by the administrative head of the general department, of which the hospital is a part. In such cases, the superintendent is usually given broader powers in the determination of hospital policy and program, and in the selection and control of personnel.

In the writer's judgment, public hospital management is likely to evidence highest efficiency where the superintendent is directly responsible to a superior officer of government without the intervention of a board. Public hospital service, generally, is of lower standard than that of private hospitals for reasons which have been indicated. With this handicap to start with, division of responsibility for management between the trained hospital superin-

tendent and an administrative board is not conducive to high morale of the hospital force, nor to economic use of public funds. The hospital superintendent needs to have the fullest possible authority for the selection and direction of personnel. He may get along fairly well with a board of managers provided that board contents itself with matters of hospital policy only. When it takes upon itself executive functions which rightly belong to the superintendent, interests other than those of efficient public service are likely to intervene to the disadvantage of the superintendent and to the disadvantage also of patient and public.

We shall assume for purposes of this discussion, that the superintendent is primarily responsible for management, subject only to such control as may be exercised by a superior officer in government in matters of general policy and program. If he has such responsibility, he has three objectives in management. He must provide an organization for the proper conduct of those activities which are directly concerned with the professional care and treatment of patients. He must also provide an organization for the efficient and economic operation and maintenance of the hospital plant. Finally, he must correlate these two groups of activities in the common business of the municipal hospital service as a whole, —which is to make the best possible use of public funds for the care and custody of sick people. We may, therefore, define the functions of hospital management as included in three major categories, as follows:

1. Professional care of patients;
2. General operation and maintenance of the hospital plant;
3. "Overhead" managerial activities necessary to coördinate 1 and 2 above.

The Professional Care of Patients

This general function of hospital service includes a great variety of special activities which fall naturally into the following groups:

1. *The attending medical service.* This service comprises the activities of physicians and surgeons of the community who give their services without charge or for merely nominal honoraria in the care of the sick in hospital and dispensary. They are responsible for the treatment of patients and for general oversight of the technical procedures involved. They may be appointed directly by the administrative authority of the hospital, but better practice is to leave their selection to a medical board appointed by the

hospital authority and independent of the attending medical staff. The attending medical staff commonly provides for its own internal organization and selects one of its number as chief of staff.

2. *The interne service.* Hospital internes are usually young, recently graduated physicians who apply for hospital appointments for further training and experience. They serve in the hospital in various capacities as aids to attending physicians and surgeons for terms of one or two years, and progress in rotation through the various special services, medical and surgical, from junior to senior house physicians or surgeons. They are paid small monthly stipends, or bonuses on the completion of their periods of service. Appointments to the interne staff are usually made by the hospital authority on recommendation of the medical board or attending staff. The senior house physician or surgeon or other resident medical officer is nominally responsible for supervision of internes, but disciplinary control of internes is vested either in the hospital superintendent or in a special committee of the medical attending staff. The former is preferable.

3. *General nursing service.* Under this head are included all nursing activities directly concerned with the care and treatment of patients. The nurses in charge of various wards, rooms, or special nursing service units are trained, *i.e.*, graduate nurses who are appointed and are under the control of the hospital director or superintendent. In their work at the bedside all nurses are subject to the orders of the members of the attending medical staff. They are assisted by student nurses of the hospital training school. A director or superintendent of nurses is appointed by the hospital head to organize and direct their activities.

4. *Nursing education.* Although the training of nurses is not necessarily a function of municipal hospital work, most large municipal general hospitals maintain nurses' training schools. Student nurses are utilized in routine nursing, under the supervision of graduate nurses, as a part of their training. The student nurses are paid small sums monthly, and are given maintenance during the period of their training, which is usually two to three years. The student nurses, when engaged in routine nursing work, are, like other nurses, under the same supervision and direction as that of graduate nurses and subject also to the orders of the attending physicians. The general organization and direction of educational work is, however, usually made the responsibility of a director of the training school. In some hospitals, all nursing work, including

routine nursing and educational activities, is under the direction of a single director or superintendent of nurses. This is not regarded as good practice, except in small hospitals, because it tends to subordinate nurse training to the demands of routine nursing work, and generally lowers the standards of both.

5. *Social service.* This unit comprises one or more workers especially trained in social investigation. The primary purpose of their work is to secure information about the circumstances of patients which may be useful to physicians in determining the most desirable methods of immediate treatment and after care, and in planning the course of the patient so that he may take best advantage of all of the facilities which the community makes available for his restoration to full health and efficiency. The social worker unit, if it includes several workers, is commonly under the direction of a chief social worker, who is responsible directly, or through an intermediate medical officer, to the hospital head.

6. *Dietary.* The preparation and service of food to both patients and employees represents a group of activities which calls for the highest type of skilled professional direction. Diet is an extremely important element in the treatment of patients, and there must be, at all times, the closest coöperation between the paid officer in charge of dietary and those responsible for other measures of treatment. For this reason we have considered dietary as belonging to the major functional group, professional care of patients. The officer in charge of dietary must, however, work in close coöperation also with the officers in charge of special services of plant operation and maintenance, in order that food supplies may be properly and economically utilized, and in order that the equipment for food preparation and service may be properly maintained. The dietitian or director of the dietary should be responsible to the hospital superintendent directly, or through an intermediate officer representing the superintendent in the general direction of professional care of patients.

7. *Other special services.* The hospital organization for the professional care of patients includes a great variety of other special units which, for our purposes, may be regarded as merely adjuncts of the general medical and nursing organization represented by the attending medical staff service, the nursing service, and the interne service. Such units as the laboratory, X-ray, diagnostic, and treatment services, ambulance and emergency ward, operating room, and other units which provide for treatments of a special nature

by baths, heat, massage, exercise, etc., are usually under the direction of representatives of the medical and nursing groups concerned, and as assigned by their superior officers.

Routine laboratory work is most often done by internes under the direction of a pathologist who is either a member of the medical staff or a paid employee appointed and directly responsible to the hospital head or an intermediate officer. X-ray work is done, as a rule, by a member of the medical attending staff who receives special compensation for his services, and with respect to these duties is, therefore, directly responsible to the hospital head. Ambulance and emergency ward service is most often provided by members of the interne staff who are members of the paid hospital personnel and preferably responsible to the hospital head or his representative. The operating room is under the supervision of a graduate nurse, responsible directly to the director or superintendent of nurses, and through her to the hospital head. Other special treatment services may be under the supervision of graduate nurses as assigned by their director, or other paid technicians appointed by the hospital head and under his direction.

The point of particular emphasis, with respect to all of these various service groups for the professional care of patients, is that in a public hospital the line must be sharply drawn between the managerial responsibility of the hospital head and the advisory and supervisory responsibilities of the attending medical staff. The fact must never be lost sight of that the head of the hospital maintained by public funds must have direct and unequivocal responsibility for the work of all paid officers and employees. If a physician member of the medical staff becomes a paid employee of the hospital, the hospital superintendent, and not the medical board or staff, must determine what shall be done for the money expended. The hospital superintendent may choose to delegate supervisory duties to the medical board or staff in many such instances, but it is subversive of good organization to have any misunderstanding on where final authority for the direction of paid employees should be lodged.

General Plant Operation and Maintenance

No matter what the nature of the hospital service and its organization for the professional care of the sick, good management requires that the general function of plant operation and maintenance shall be divided into several special service units, each under

the direction of a competent technical head, responsible directly to the hospital superintendent. The service units commonly defined are:

1. *Care of buildings, grounds, and equipment.* Under this head are included the operation and maintainence of utilities, such as light, heat, and power supply, water supply, disposal of garbage, sewage, and other refuse; the care and repair of equipment, such as vehicles, laundry equipment, and kitchen equipment; the care and repair of buildings and furniture, including carpenter work, painting, etc.; the care and upkeep of grounds, walks, driveways, etc. Such activities are usually under the direction of a chief engineer who is responsible either directly to the hospital head or to an intermediate officer as a steward or plant manager.

2. *Storekeeping.* This group of activities includes all those having to do with the inspection, receipt, storage, and distribution of hospital supplies, and minor equipment, commonly kept under stores control. In some instances, the officer in charge of these activities may also be responsible for purchasing, but as a rule purchasing is done either by the hospital superintendent or by a purchasing agent, otherwise provided for in the general organization of the city government. It is the duty of the storekeeper also to maintain proper inventories of supplies and equipment in his keeping, together with current records of the receipt and distribution of supplies and other stored articles.

3. *Housekeeping.* In this group are included all those activities concerned with the domestic service, other than the preparation and service of food, such as the care and cleaning of hospital wards or rooms, and their equipment; the care, cleaning, and repair of linen and clothing; and janitorial and custodial activities in connection with general maintenance and upkeep of the hospital interior. A housekeeper or matron is usually in charge of this service, and is responsible directly to the hospital head or intermediate officer in charge of plant operation and maintenance.

The three activity groups or service units, as outlined above, may not always be recognized as independent units, particularly in small hospitals where economic use of personnel requires that employees serve in many capacities. For example, it may be necessary to utilize employees of the general housekeeping service as aids in the preparation and service of food, and to combine the housekeeping and dietary services in a single unit under the dietitian. Similarly, employees ordinarily engaged in the general care and upkeep of

buildings, grounds, and equipment may be assigned to assist the storekeeper in his work. It is, however, essential that all of the activities considered as falling under the head of general plant operation and maintenance shall be carried on under the direction of technically skilled officers, directly responsible to the hospital head or to an intermediate superior officer, as a steward or plant manager.

"Overhead" Managerial Activities

If the hospital is under the administrative control of a board or other authority superior to the hospital executive, that is, the superintendent or director, many of the general overhead activities, such as purchasing, accounting and record keeping, and personnel selection and control, may be carried on under the direction of this superior authority. If, for example, the hospital is merely one unit of a general department of welfare, a department of health, or a department of hospitals, which includes several other institutions, the head of such department should be responsible for all overhead activities which are common to all units of the department. But assuming that the hospital superintendent or director has no immediate superior, except the head of the city government, we may outline his duties as follows:

1. *Personnel selection and control.* This is perhaps the most important duty of the superintendent in this field of "overhead" direction. If he is the authority directly responsible for spending public funds, the selection and control of personnel should be in his hands, and wholly free from all considerations of political expediency. The only basis of selection should be merit, and if the hospital superintendent himself is chosen for merit only, there should be as little limitation as possible of his authority to choose his assistants. Civil service, if it exists, or any other general plan of employment control for public service will, of course, limit considerably the superintendent's power to "hire and fire." It is the writer's experience, however, that even granting the merits of civil service in public employment generally, such limitation of the hospital superintendent's power of appointment and disciplinary control as civil service imposes does not make for good hospital administration, provided the superintendent is competent and given sufficient tenure to develop and carry out a definite personnel policy.

2. *Purchasing.* The duties of the hospital superintendent in this respect are sometimes limited through the establishment of a

central purchasing department of the city government which represents all departments or a special group of them. In such case, the superintendent's purchasing duties would be only such as were delegated to him by the general purchasing agent. Under other circumstances, the superintendent would have primary responsibility for the development of supply specifications and the purchase of such supplies accordingly, on contract or open order as authorized by his budget.

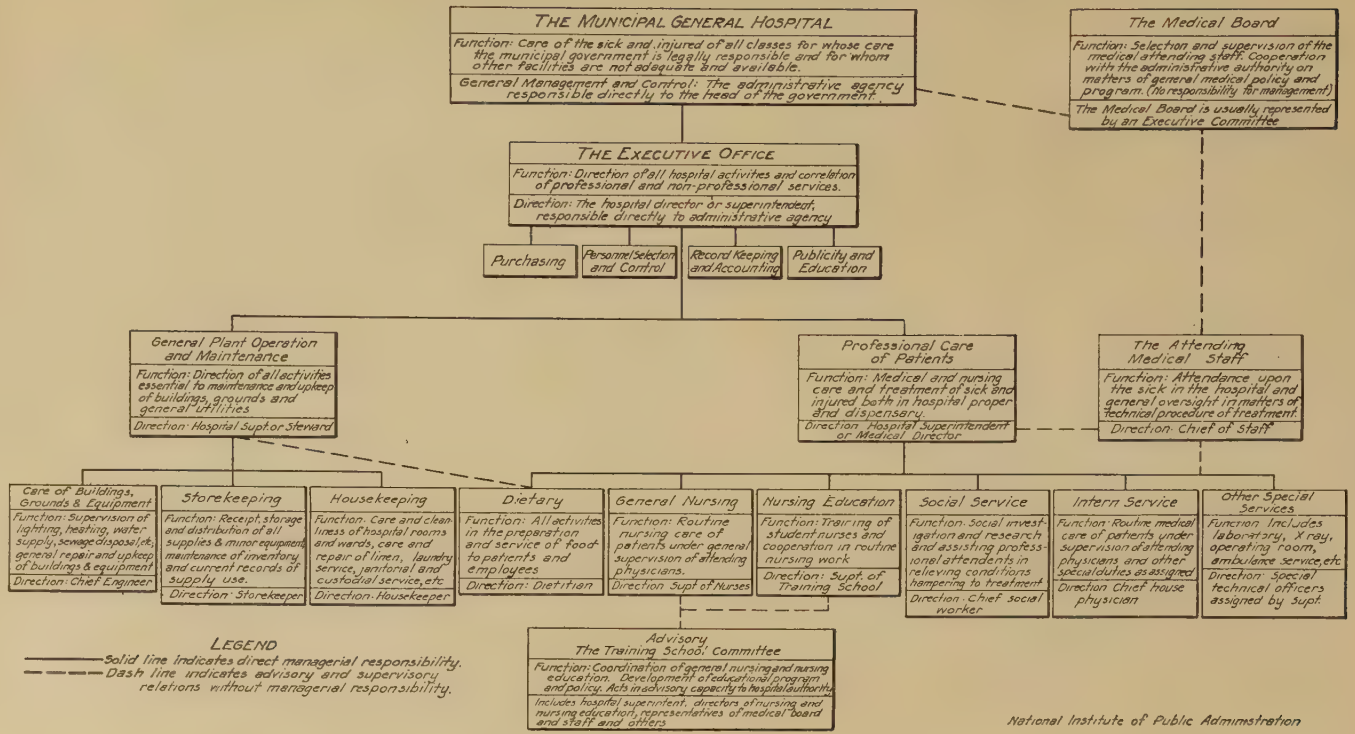
3. *Record keeping and accounting.* With respect to general financial accounting, the hospital superintendent will have relatively little responsibility, provided the organization of the general accounting service of the city government has been properly developed. All accounting work for the hospital would, under such circumstances, be done by the general accounting department. It would, however, be necessary for the superintendent to maintain such records of expenditure and work performed as would permit the development of units costs for the various hospital functions. The most important phase of record keeping, from the point of view of hospital efficiency, is the maintenance of a complete system of patient records and the results of treatment. Unless such records are maintained, there is no possibility of determining the benefits derived from public expenditure.

4. *Publicity and education.* Under this head are included all activities designed to inform public officials of hospital work and results, and to provide for the general education of the community in hospital affairs. Among the activities worthy of special mention are the preparation and publication of hospital reports, bulletins, and the furnishing of news articles for the press; the maintenance of a hospital reference library for physicians, nurses, and other employees; the development of coöperative relations with organized groups of the community through lectures, conferences, etc., and the establishment of hospital auxiliaries; the preparation of general and special manuals of instruction for the guidance of physicians, nurses, and others in their relations one to another and to the hospital patient.

An Outline of Hospital Organization and Functions

Assuming a municipal hospital in which the hospital superintendent is given full managerial responsibility, whatever may be the relation of the hospital unit to other units of government, a typical functional organization may be pictured as in the accompanying chart.

THE FUNCTIONAL ORGANIZATION OF THE MUNICIPAL GENERAL HOSPITAL


THE MUNICIPAL GENERAL HOSPITAL
Function: Care of the sick and injured of all classes for whose care the municipal government is legally responsible and for whom other facilities are not adequate and available.
General Management and Control: The administrative agency responsible directly to the head of the government.
The Medical Board
Function: Selection and supervision of the medical attending staff. Cooperation with the administrative authority on matters of general medical policy and program. (No responsibility for management)
The Medical Board is usually represented by an Executive Committee
THE EXECUTIVE OFFICE
Function: Direction of all hospital activities and correlation of professional and non-professional services.
Direction: The hospital director or superintendent, responsible directly to administrative agency
Purchasing
Personnel Selection and Control
Record Keeping and Accounting
Publicity and Education
General Plant Operation and Maintenance
Function: Direction of all activities essential to maintenance and upkeep of buildings, grounds and general utilities
Direction: Hospital Supt or Steward
Professional Care of Patients
Function: Medical and nursing care and treatment of sick and injured both in hospital proper and dispensary
Direction: Hospital Superintendent or Medical Director
The Attending Medical Staff
Function: Attendance upon the sick in the hospital and general oversight in matters of technical procedure of treatment.
Direction: Chief of Staff
Care of Buildings, Grounds & Equipment
Function: Supervision of lighting, heating, water supply, sewage disposal, etc, general repair and upkeep of buildings & equipment
Direction: Chief Engineer
Storekeeping
Function: Receipt, storage and distribution of all supplies & minor equipment, maintenance of inventory and current records of supply use.
Direction: Storekeeper
Housekeeping
Function: Care and cleanliness of hospital rooms and wards, care and repair of linen, laundry service, janitorial and custodial service, etc
Direction: Housekeeper
Dietary
Function: All activities in the preparation and service of food to patients and employees
Direction: Dietitian
General Nursing
Function: Routine nursing care of patients under general supervision of attending physicians.
Direction Supt of Nurses
Nursing Education
Function: Training of student nurses and cooperation in routine nursing work
Direction: Supt. of Training School
Social Service
Function: Social investigation and research and assisting professional attendents in relieving conditions hampering to treatment
Direction: Chief social worker
Intern Service
Function: Routine medical care of patients under supervision of attending physicians and other special duties as assigned
Direction Chief house physician
Other Special Services
Function: Includes laboratory, X ray, operating room, ambulance service, etc
Direction: Special technical officers assigned by Supt
Advisory
The Training School Committee
Function: Coordination of general nursing and nursing education. Development of educational program and policy. Acts in advisory capacity to hospital authority
Includes hospital superintent, directors of nursing and nursing education, representatives of medical board and staff and others
LEGEND
Solid line indicates direct managerial responsibility.
Dash line indicates advisory and supervisory relations without managerial responsibility.

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The schematic representation of the general organization of the hospital here shown must not be regarded as ideal or applicable to all hospitals. In all, however, the same functions must be performed, but the character of service or small size of the hospital may make possible considerable simplification of organization, and the assumption by the superintendent himself of many duties of a routine nature that he could not possibly assume in a large institution. Generally speaking, however, it is better for the superintendent to delegate authority for routine technical matters of plant operation to officers of special skill or experience in the matters concerned, and to content himself with personal direction of those "overhead" activities which are necessary for the proper correlation of all service branches. In some public hospitals the superintendent, if he is a physician, may take personal charge of treatment, in fact, provide such treatment as may be necessary. This may be practicable in a small institution dealing with a patient group which does not require the attention of specialists in the various fields of treatment, as for example, a hospital for chronic invalids. But in the majority of hospitals, it is better that the superintendent leave actual treatment to an attending medical staff or house medical staff or both.

Basic Standards of Hospital Management

It is not within the scope of this volume to consider in detail the methods and procedures of each of the various elements of hospital organization as outlined in the above chart. We can only comment briefly on the more significant of these with respect to their special significance in management. As already noted, public hospital service has not progressed as far toward the adoption of uniform standards of procedure as have private hospitals. It is highly desirable that there be a continuing effort on the part of all hospitals, public and private, to put into practice such standards as have been endorsed by competent national agencies, as the American College of Surgeons and the American Hospital Association. The adoption of these standards means more efficient service to patients and public, and uniformity of practice permits the testing of costs and results in comparable hospital services. But whether these formal standards are adopted or not, there are certain principles which must be applied in the management of all public hospitals if the rights of patients and the public are to be conserved. We

have already discussed them in a general way, but their restatement in summary form will not be amiss.

1. Responsibility for personnel control and general management of the hospital should be undivided and vested in a trained hospital superintendent, subject only to such general supervision with respect to hospital policy and program as may be necessary under the existing form of government.

2. The hospital should have a properly organized and competent medical board or staff for the treatment of patients and to advise the superintendent on matters of medical policy and practice.

3. The hospital service generally should be so organized by functional units that the superintendent may delegate executive responsibility to officers especially skilled in the performance of these functions.

4. The hospital should keep a complete record of the patient with all facts necessary for his identification and protection, his social and economic circumstances, the nature of his illness, the nature of his treatment or other service rendered him, and the results of such treatment or service.

5. The hospital should keep a complete record of the money received and expended by the hospital in such detail with respect to the nature and results of expenditure as is necessary to balance cost against work performance and results.

6. The hospital should maintain such control of the purchase, storage, and use of supplies, equipment, and other objects of expenditure that abuse or misuse of these things may be prevented.

7. The hospital should keep city officials and the public informed regarding the service rendered by the hospital, what that service costs, and what results are obtained in the betterment of individual and community health.

8. The hospital should serve as a medium for the general health education of the public and for the training of physicians, nurses, and other workers in their respective professions and occupations.

9. The hospital should coöperate with all other health services, public and private, for the promotion of community health and welfare.

In thus attempting to state these principles or public hospital organization and management, we would not have the reader assume that these are at all exhaustive of the subject. We might, for example, say good public hospital management requires that

no patient should be provided with free service at public expense who is capable of paying for such care in whole or in part, (except in those hospitals for communicable diseases where the economic status of the patient is not a determining factor). Or we might say that no more patients should be received for treatment than will permit conformity with recognized standards of efficient hospital work. But although these limitations of hospital program are undoubtedly necessary to good management in many instances, public policy or emergency requirements may determine otherwise. We have, therefore, attempted to set forth only those essentials to good hospital organization and functioning which are applicable to all public hospitals at all times and in all places.

CHAPTER XIX

THE MEDICAL AND NURSING SERVICES OF THE HOSPITAL AND THEIR MANAGEMENT

Whatever the type of hospital work, there must be a medical staff which shall be responsible for seeing that treatment is provided as indicated by the patients' need and in accordance with recognized technical and ethical standards of medical practice. The method of selecting such a medical staff will depend somewhat upon the nature of the administrative authority of the hospital concerned. If the hospital is administered by a board of trustees with full authority over all matters, medical as well as nonmedical, such board of trustees should be responsible for appointing the members of the medical staff. This is the usual situation in nongovernmental institutions. If, on the other hand, there is no board of trustees, but instead a single director or commissioner solely responsible for the administration of the hospital or hospitals, it is desirable to have the staff chosen by a medical board appointed preferably by the head of the city government. The question why it would be undesirable to permit the single officer who is the administrative head of the institution to appoint the medical staff is pertinent. As a matter of fact, this is sometimes done in public hospitals, chiefly those of specialized type where the scope of medical work is limited and the number of attending physicians required few. In the average general hospital, however, the diversity of medical work requires the selection of many physicians with different capabilities and of different kinds of technical experience and skill. In making such appointments from among the qualified practitioners of the community and in providing for their later supervision and adjustment in the plan of medical work, experience indicates that the judgment of a medical board of competent physicians is better than the judgment of an individual. Furthermore, the administrative officer of the hospital can thereby be relieved of many conflicts with his medical staff on matters of purely pro-

fessional and technical concern, which might be decidedly embarrassing, if he were the appointing officer.

A medical board should not, as we have earlier said, have any administrative responsibility. It should be limited in its functions to the selection of the members of the medical staff, the planning of staff work, the supervision and direction of its staff appointees in technical matters, and to advising the administrative head of the institution in matters of common concern. The medical board should be sufficient in number to be really representative of the medical interests of the community, but not so large as to be unwieldy in its functioning. A medical board of from five to nine members, if properly selected, is a satisfactory working unit. The tenure of board members should not be so long as to give any group of physicians appointed to it the opportunity of establishing itself as a sort of medical hegemony dominating public hospital affairs in the community, nor so short that the development of a constructive medical program is likely to be interfered with at every political turnover. Appointments to the medical board should preferably be made for terms of from four to six years and in such a way that one or two members only, *i.e.*, a minority, may be appointed each year. For example, if a medical board of five members were established and their tenure were fixed at five years, the first appointed members might be appointed as follows: one for one year, one for two years, one for three years, one for four years, and one for five years. Each year thereafter, then, one appointment only would be made. The advantage of such a plan is that there is always a majority of the board which is experienced and familiar with hospital problems.

The Medical Staff; Its General Organization and Duties

In some instances it may be satisfactory for the members of the medical board to act also as the medical attending staff of the hospital in the treatment of patients. It is preferable, however, that the medical board leave this work wholly to the attending and consulting physicians whom it appoints and over whom it exercises supervision.

No matter how chosen, the medical staff of a general hospital comprises a number of physicians and surgeons of several ranks or grades, as chief attending physicians and surgeons, senior attending physicians and surgeons, and junior attending physicians and surgeons. Hospitals differ considerably with respect to the

grades recognized and their designations, but in practically all hospitals the medical staff is graded in some such manner. These grades are intended to represent different degrees of responsibility for the medical treatment of patients, as well as the differences in the relative skill and experience of the physicians and surgeons.

To each of the special branches of a general hospital's work as the general medical service, the general surgical service, the children's or pediatrics service, the maternity service, or other branch, one or more groups of physicians or surgeons of the various ranks are assigned. With respect to the general plan of work of these groups there is considerable variation. In order to provide opportunity for a large number of physicians and surgeons to serve on the hospital staff, provision may be made, in one hospital, for assigning to each of the special service branches two or more groups of attending and assistant attending physicians which are rotated in active service throughout the year at intervals of several months. In another hospital, the chief attending physicians of each particular group may remain continuously on service with rotation in active service provided only for the assistant attending physicians of the various grades of the group. In still another hospital, all members of the attending staff, whatever their rank, may remain continuously on service. The disadvantages of frequent changes in the attending medical personnel are that continuity of medical policy and procedure is difficult to maintain and lack of such continuity is conducive neither to good hospital management nor patient welfare. On the other hand, the frequent changes in medical personnel resulting from rotating the various physician groups in service for short intervals, permits a great many more physicians to become associated with the hospital. Many practicing physicians feel that it is unfair for the public hospital to limit its staff appointments to a few physicians who remain continuously on duty, to the exclusion of other practitioners.

It seems best in public hospital service, at least, to provide for continuous service by a small group of especially skilled attending physicians for the various special fields of medical and surgical work, and a rotating service at intervals of a few months for the rank and file of attending physicians. By this plan a reasonable continuity of medical policy and practice is guaranteed, and opportunity is given a large number of the physicians of the community to serve the hospital as members of the staff in the lower ranks.

If there is a dispensary or out patient department of the hospital, a medical staff must also be provided for the treatment of dispensary patients. The dispensary staff is usually chosen, and functions in the same way as the staff of the hospital proper and is assigned to such special branches of dispensary work as may be carried on. As a rule, in public hospitals the dispensary staff is nominally under the supervision of the chiefs of the staff groups of the hospital proper, but appointments to the dispensary staff rarely involve any duties or confer any privileges in the hospital wards. The relationship between hospital and dispensary medical staffs has not as yet been satisfactorily worked out, but the present tendency is to combine the medical staffs of hospital and dispensary in one organization wherever possible, so that the chief attending physicians and surgeons of the various special branches of hospital work will also have responsibility for organizing and supervising corresponding branches of the dispensary work, and the dispensary physicians will have certain privileges in the hospital. Those who have given most study to the question of dispensary organization regard it as highly desirable to provide for an extremely close relationship between the work of the physicians of hospital and dispensary. In a special report of dispensaries of New York City by the public health committee of the New York Academy of Medicine in 1920, it was recommended that a plan of correlating the two medical staffs be worked out so that there would be a combined graded service for all attending physicians of hospital and dispensary.[1] Such combined service should be under one medical supervision and should provide a scheme of promotion from dispensary staff to hospital staff and a rotation of service for junior members of the hospital attending staff between the dispensary and hospital wards.

It would appear that the coördination of hospital and dispensary medical work in public hospitals can be most satisfactorily brought about by the adoption of the following rules:

1. Appointments to both hospital and dispensary medical staffs should be made by the same authority whether that authority be a board of trustees, a medical board, or a medical director or superintendent.

2. Responsibility for supervision and direction of the combined hospital and dispensary medical work should be placed upon chief attending physicians and surgeons of the various special branches

[1] Public Health Committee, New York Academy of Medicine, *Report on a Study of Dispensaries in New York City*, 1920.

of work of the hospital proper, who should serve continuously in such supervisory capacity.

3. The combined hospital-dispensary medical staff should be so graded and so planned that there will be a rotation in service between the hospital and dispensary for the junior grade physicians and surgeons, and an opportunity for all to advance from the lower to higher positions in the combined service.

4. As far as possible appointments to the medical staff of the hospital proper should be made from those members of the dispensary staff who, by length of service and demonstrated fitness, are entitled to such recognition.

Medical Organization in Its Relation to Special Treatment Needs of Patients

The medical work of a general hospital is usually divided into two major branches or "services," as they are called, namely, a medical service and a surgical service. The hospital wards or other bed units are correspondingly divided into two parts, a medical "side" so called, and a surgical "side." Patients are admitted to one "side" or the other depending upon the nature of their ailments. On the medical side, if circumstances warrant, there may be a division of the major medical service into several other subordinate units, medical in character, as a general medical service, a children's or pediatrics service, a maternity service, a tuberculosis service, a venereal disease service, etc. On the surgical side there may also be further divisions of the surgical service, as a general surgical service, a gynecological service (surgical conditions of women), an orthopedic service (correction of physical deformities), etc. On each "side," medical or surgical, special wards or rooms are provided for each of the various groups defined, or others as required.

For each special service branch there is, as previously described, a group of staff attendant medical and surgical officers graded as to rank. Each group is responsible under the direction of its chief attending officer, or officers, for carrying on treatment and for supervising the work of internes who may be assigned to their particular branch or branches. At least one of each special group of attending physicians or surgeons is expected to attend the hospital daily, examine patients, give treatment when necessary, and direct the work of nurses, internes, and other professional attendants. All members of the attending physician group of a

particular service are subject to call as required by their chief. The common practice is for the members of each group of attending physicians or surgeons to adjust their hospital duties and hours of service among themselves in accordance with the hospital demand and the exigencies of their private practices.

In the majority of public hospitals the routine medical care of patients is carried on by internes under the general direction and supervision of the attending physicians and surgeons. At least once daily an attending physician of the staff is expected to make "rounds" of the special patient group assigned to his care in company with an interne and a trained nurse, and to leave directions for treatment to be given. The internes serve for one or two years, during which time they are assigned in rotation to the various special services, medical and surgical, and they progress according to schedule, in rank and responsibility.

In the dispensary a somewhat similar definition of service groups is provided although the number and variety of special services or "clinics" may be greatly extended depending upon local circumstances. In the New York City dispensary study previously referred to, it was found that the range of special dispensary services, or "clinics," included the following: applied therapeutics, cardiac diseases, chiropody, dental, diabetic, diseases of metabolism, ear, eye, fractures, gastric, gastrointestinal, genitourinary, gynecology, hydriatic, infant hygiene, internal medicine, massage, medicine (general), mental hygiene, neurology, nose and throat, obstetrics, orthopedics, pediatrics, prenatal, proctology, skin, surgery (general), syphilis, tuberculosis, and X-ray and electric treatment.

Few dispensaries provide any such imposing array of clinics as has been listed above. There is no rule of general application to dispensary work with respect to the number or nature of clinics best suited to efficient operation. This is to be determined mainly by local patient needs and the interests of the physicians of the community in special phases of medical work. In general, the clinic services of the dispensary should correspond as closely as possible to the service branches of the hospital, but even to this rule there are numerous exceptions. In common practice, the same major service branches as are defined in the hospital are recognized in the dispensary as a medical service and a surgical service. Since in most public institutions provision for the treatment of nonhospital cases of tuberculosis and venereal diseases

is necessary, these two special medical clinics are usually defined. Since, also efficient municipal health service calls for especial effort in the prevention of diseases of children, there will likely be need for a general children's clinic and special clinics also for deformities and those conditions of eye, ear, nose, and throat that are peculiarly handicapping to school children. In many public dispensaries prenatal clinics for the advice and instruction of pregnant women have been found necessary for the promotion of child health. The public dispensary, whether connected with the general hospital or not, should maintain the following clinic services as a minimum, unless similar clinics are elsewhere established and adequate to public need: (1) general medicine; (2) diseases of children; (3) tuberculosis; (4) venereal diseases; (5) prenatal; (6) general surgery; (7) eye, ear, nose, and throat; (8) orthopedic defects.

As in the case of the special service branches of the general hospital, each clinic of the dispensary has its group of physicians of various ranks under the supervision of one of their number who is designated as chief by the appointing authority. The members of each clinic group attend the dispensary at the hours designated to examine and treat the patients assigned to their special charge. It is the rule for the chiefs of the corresponding services of the hospital proper to exercise a nominal supervision, at least, over the corresponding clinics of the dispensary and in some large dispensaries it has been found desirable to employ a paid medical director of the dispensary who may be responsible for seeing that the medical work is done efficiently and in accordance with the best practice.

The Internal Organization of the Medical Staff

Whether the medical staffs of the hospital proper and the dispensary are combined as one organization or are independent, and whether or not there is a paid medical director to represent the administrative head of the institution in the hospital proper, dispensary, or both, it is highly important that there be a chief of staff, selected from among the staff members, through whom the administrative head of the hospital may act in matters which affect staff organization and personnel, and to whom he may look for advice and information on questions of routine medical policy and practice. Through such staff officer, the medical board also, if there is one, may maintain its contact with the actual work of its staff appointees. Such chief of staff should be appointed by

the medical board (or board of trustees, if the institution is administered by such board).

The internal organization of the medical staff is usually left somewhat to the discretion of the staff itself. There is ordinarily an executive committee which may be appointed by the chief of staff from among the chiefs of the various special service groups, including the chief of staff as chairman. If there is a medical board, it may define the general organization of the staff and appoint the executive committee. Other committees may be created by the staff of its own initiative or by the medical board, as a committee on records, a committee on research, etc.

Where there is a medical board primarily responsible for the supervision of the medical staff, it is desirable, as we have said, that it remain independent of actual staff duties. That is to say, no members of the medical board should be members also of the medical staff. Otherwise, since the board is responsible for staff appointments and general oversight of staff work, some of the members of the staff, as members also of the board, would be in a position to exercise undue influence on the board as to staff appointments, or otherwise influence, to their personal advantage, the medical policies of the board. Where the institution is administered by a board of trustees with full authority over lay as well as medical matters, it is likewise undesirable to have members of the medical staff on the board of trustees.

Compensation of Hospital and Dispensary Physicians

Members of the medical staffs of hospitals and dispensaries are rarely paid. It would be well-nigh impossible to compensate all physicians adequately for their services in public hospitals and dispensaries, except at a cost which would be prohibitive for most cities. The present tendency, however, in the larger hospital dispensaries, at least, seems to be toward the payment of small stipends to dispensary physicians. Dispensary physicians are considered as especially worthy of consideration in this respect since their dispensary work, though requiring perhaps no more time than would be required of hospital physicians, does not offer them as great opportunity for acquiring professional reputation and prestige as is enjoyed by the latter. It is the experience of those hospitals where small salaries have been paid to dispensary physicians that higher efficiency in dispensary work has resulted. The nongovernmental hospitals and dispensaries have been more liberal in

the matter than the governmental institutions, although it would appear that the situation in the latter is one in which compensation of physicians is even more warranted, in view of the fewer opportunities for professional advancement, and other relatively unattractive features of public service.

The payment of small salaries alone would not be sufficient to attract the most competent physicians to hospital and dispensary work, and in some instances, it might have the effect of attracting some of the less competent physicians of the community whose private practices were not self-sustaining. On the whole, it is believed that the improvement of medical service in public institutions, must depend mainly upon offering reputable physicians of the community opportunity rather than wages. It might be desirable in the public dispensary to grant small honoraria to junior physicians of high ability, who because of the necessity of earning a living from their profession, would not otherwise be able to give their time to public work. But if the organization of the hospital and dispensary staff or staffs is such as to afford physicians opportunity to improve their technique and to progress in rank to the more honored and more responsible positions in the hospital, thereby increasing their prestige, it is not believed that the salary question will need to be raised.

With the interne staff of the hospital the situation is somewhat different. The average hospital interne is a recent graduate of a medical school and as a student has probably been dependent upon others for several years. For him to accept an appointment in hospital work means that for a year or two following his graduation he must continue to be more or less dependent. Service as internes in public hospitals is not as attractive to young, recently graduated, physicians as service in private hospitals, because of the generally lower standards of service in the former and the lower standards, also, of living. To offset, in a measure, these almost inevitable disadvantages of public service, it would appear that if public hospitals generally are to compete with private hospitals for internes, they ought to offer their internes a reasonable compensation, either in the form of a monthly stipend of from $25 to $50, or a bonus of several hundred dollars on the completion of their periods of service. A few public hospitals do make such provision for internes but the majority pay their internes little or nothing, and in consequence, often find it difficult to secure well qualified internes. Paying internes a bonus on the completion

of their services is often more satisfactory than paying them monthly stipends, for the former provision helps to hold the interne in the hospital service to the completion of his term of service, and gives him a substantial sum with which to begin his practice.

The Hospital Nursing Service

Hospital nurses, whether in public or private institutions, should be *trained* nurses. Since the natural and, in most communities, the only training ground for nurses is the hospital, the best hospitals have been compelled to set up training schools for nurses under their own auspices. There are few good hospitals of large size to-day, public or private, which do not maintain schools of nursing. In some of the smaller communities where hospital development is as yet in a rudimentary state, and where the hospital is too small to permit satisfactory training courses, training schools for nurses as hospital adjuncts have not yet been provided, but the training school is so universally a part of efficient hospital organization that we may well regard it as one of the hospital's basic elements.

The hospital with a school of nursing has two types of nurse in its service, namely, the graduate nurse and the undergraduate or pupil nurse. It has also two functions to perform through its nursing organization, namely, utilization of nurses, graduate and undergraduate, in the actual treatment of patients, and the education of the student nurses in the classroom and at the bedside. The usual procedure is for the hospital to employ a small corps of graduate nurses who act as supervisors of nursing work in the wards, and to utilize the student nurses for routine work under the eyes of these trained supervisors, to as great extent as is possible and compatible with their student work.

For the general direction of the purely practical nursing work which the hospital requires, there should be a superintendent of nurses. For the training of nurses and the adjustment of their educational curriculum to the practical requirements of hospital duty, there should be a superintendent of the training school. In some hospitals one superintendent of nurses is responsible for both phases of nursing activity but this rarely works out to the advantage of either the hospital or pupil nurse. In the best hospitals there is a superintendent of nurses whose responsiblity it is to see that the necessary nursing work of the hospital is properly done, and a superintendent of training school whose business it is to

fit pupil nurses to do what needs to be done efficiently, and maintain proper balance between practical nursing routine and the training curriculum. There must naturally be the closest coöperation between the two phases of nursing activity; overemphasis of the practical side of nursing training is as bad as overemphasis of instruction in pure theory.

The relationship which exists between the work of the medical staff and the nursing organization is necessarily close, and the attending physicians have a right to insist that in the actual treatment of patients nurses shall be subject to their orders. But experience proves that the management of nursing work, including both routine hospital duty and the classroom training of pupil nurses, cannot safely be left to a medical board or staff. The medical board or staff is made up of unpaid medical practitioners of the community whose interest in the hospital and its development is often necessarily secondary to their interest in other professional matters. Physicians in private practice are rarely competent to direct intelligently a nursing organization and nursing program which demands for its management the highest type of professional nursing experience and training. Interference on the part of a medical board or staff with the educational program of a school of nursing almost inevitably results in lowering educational standards. It seems inevitable that such interference will occur when a medical board or staff is given full responsibility for management of the nursing organization, particularly where the training of nurses is involved.

It is clear enough that the administrative head of the hospital must have final responsibility for determining what the program of nursing and nursing education shall be, since the carrying out of this program involves considerable expenditure of public money. But the administrative head of the hospital is chiefly concerned, and rightly so, with getting the hospital's business done as efficiently and economically as possible. He may recognize the necessity of maintaining a nurses' training school of high standard, but he is not a specialist in nursing education and is, therefore, poorly qualified to administer such an educational enterprise. It is quite generally conceded that complete separation of the hospital from the training school for nurses is a next forward step in nursing education, and it is probable that the future development of training schools for nurses will either be in connection with the larger universities, or as independent technical schools. The students in

such schools would go to the hospitals for practical experience just as medical students go to hospitals for their practical training. For a long time to come, however, training schools for nurses will probably continue in their present relationships to the hospitals. In order to relieve the hospital administrator of embarrassing problems of purely pedagogic interest, and at the same time leave him his rightful responsibility over hospital expenditures and personnel, some hospitals have solved the problem satisfactorily by creating a training school advisory committee to which all matters involving training school policy and program are referred. The committee is made up of representatives of the medical board or staff, the board of trustees (if the hospital is so administered), alumnæ of the training school, and other persons in the community who are acquainted with training school needs and with their educational problems, including the superintendent of the hospital, the superintendent of nurses, and the superintendent of the training school as ex officio members. If the hospital is administered by a board of trustees, such board should appoint the training school committee; if it is administered by a single officer, that officer should appoint the committee. It must be understood, however, that the training school committee should exercise advisory functions only. It should stand in the same relation to the administrative head of the hospital service in matters of training school policy as does the medical board in matters of medical policy. It should have no responsibility for spending money nor for the disciplinary control of paid personnel.

The nursing work carried on in the dispensary calls for no special comment. It should be under the same supervision as nursing work elsewhere in the hospital. There should be a graduate nurse supervisor detailed to oversight of dispensary nursing service and pupil nurses should receive practical training and instruction in dispensary practice. Their relation to the medical staff of the dispensary should in general be the same as to the medical staff of the hospital proper.

Recruiting and Training Nurses in Public Service

The problem of providing a sufficient number of trained nurses to meet the increasing demands of hospital work, and to carry on the rapidly extending public health nursing activities, is a serious one in many communities. In times past, before there was such great demand for women in commercial and industrial life, and

when the idea that "woman's place is in the home" was commonly accepted as delimiting woman's sphere, the two chief opportunities for the employment of women were in nursing and teaching. To-day, however, nursing and teaching must compete for women against commerce and industry. As the result, it is becoming increasingly difficult for training schools for nurses to maintain an adequate quota of pupil nurses of the desired type. The girl who needs to make her own way finds it possible to fit herself for commercial and industrial work with much less preparation and at much less cost than would be required for nursing or teaching, and her immediate earning power in the former fields is as good, if not better, than in the latter. The freedom from formal professional rules and restraints which commercial and industrial employment afford is another factor of considerable importance in turning women away from the nursing profession. In public hospital service the difficulties of recruiting pupil nurses are greater, perhaps, than in private hospital service. As private general hospitals commonly maintain higher standards of work, so private hospital training schools for nurses are better organized and better equipped. Nurses in private institutions are as a rule better paid, their opportunities for professional advancement and social enjoyment are usually better, and the patient contacts afforded them are invariably more pleasant and more advantageous than public institutions permit.

Public hospital training schools for nurses have, however, one resource which, if taken advantage of in the recruiting of pupil nurses, will offset to considerable degree their lack of resources in other respects. The development of the field of public health nursing for the prevention and control of communicable diseases and the promotion of infant health has made new opportunities for trained nurses. Training in public health work of this kind can be better provided by public hospitals since they are in close coöperation, if not in actual administrative coördination with other activities of government for health protection and health education. Hospitals for communicable diseases, which are essentially public institutions, can be utilized to train public hospitals nurses in the care of these diseases, an opportunity rarely available to nurses in private hospital training schools. The field nursing services of the health department can be utilized also to give pupil nurses experience in infant hygiene, health supervision of school children, home supervision of cases of communicable dis-

eases including tuberculosis and venereal diseases, and many other activities with which private hospitals have little or nothing in common. Such opportunities, if made use of and thoroughly exploited by public hospital authorities, would undoubtedly serve to attract more and better students to their training schools. There can be no question but that given a properly coördinated organization of the public agencies for the prevention and treatment of disease, the training of nurses in government hospitals is better adapted than that of non-government hospitals to the needs of those nurses wishing to enter the public health field.

Pupil nurses receive their board, room, and laundry, and small monthly allowances of from eight to fifteen dollars, rarely more. The pecuniary compensation offered is merely a survival of the apprentice system which has characterized nursing training from the beginning. Such compensation has no great significance as an inducement to women to take up nursing training. In fact, in a few of the best training schools where these allowances are not made, but instead tuition fees are charged, the increasing enrollments of these schools evidence that pupil nurses prefer to pay for the best training rather than be paid for training not so good.

Raising Standards of Nursing Education

The chief problem in bettering standards of nursing education seems to be that of separating institutionally the hospitals and training schools and thereby completely abandoning the age-old hospital apprentice system. There must always be close coöperative relationship between nursing training schools and hospitals just as there is close coöperation between the best medical schools and the hospitals, but professional nursing education must not, if it is to attain high standards, be made subservient to the exigencies of professional nursing practice. The apprentice system of training physicians was abandoned many years ago to the great advantage of medical education. Nursing education should be similarly reorganized.

The maintenance of higher standards of nursing education through the establishment of schools of nursing independent of hospital administrations will, it is believed, contribute materially to the raising of standards of payment for nursing service, whatever the field of nursing employment. At the present time the average annual compensation of trained nurses in public service is about the same as that of good stenographers or clerks. In the

majority of cities, $1,200 to $1,500 a year is regarded as sufficient for a trained public health nurse in routine field work. Even in the supervisory positions in health nursing, the nurse is rarely able to command more than $2,400 a year. The salaries of nurses performing similar work for private health organizations are slightly higher on the average than in public service. In view of the arduous work of the public health nurse, the long hours and lack of leisure time, and the high type of professional experience and technique demanded, public health nurses' salaries certainly need upward revision.

For graduate nurses in public institutions salaries are also extremely low, although such nurses are furnished room, board, and laundry in the institution. Except in some of the largest cities institutional nurses are rarely paid more than $100 a month even in the supervisory grades, and from $50 to $75 a month is held to be fair compensation for others when full maintenance in the institution is provided. No comment on the inadequacy of such compensation for skilled professional work seems necessary.

The freeing of professional nursing training from its hospital apprentice relations is a problem to which much attention will doubtless be given in the immediate future, but for a long time to come the present administrative unity of hospitals and nurses' training schools must be continued for the great majority of communities. There are, however, certain practical measures which may be adopted by public authorities to raise the standards of professional nursing training and encourage young women of high type to enter the profession. Some of these measures have been suggested in previous paragraphs but it may be well to restate them here in summary form.

Summary of Measures for Betterment of Opportunity for Nurses in Public Service

1. The centralization of administrative responsibility for public health and welfare activities will aid considerably in the development of educational and employment opportunities for nurses. Where such services of government are coördinated, it is possible to work out a plan of training which will give student nurses a wider experience in the fields of disease prevention and social welfare work of all kinds, and, therefore, better equip them for outside employment in these fields.

2. Improved living and working conditions for institutional

nurses in public employment is an absolute necessity. They must be provided with good rooms, preferably individual rooms, good food, opportunities for recreation and social pleasures, and more leisure time to enjoy them. Hours of nurse duty in many public institutions are far in excess of those thought desirable for women in other employments, although institutional nursing duty is more exacting and fatiguing than almost any other work for which women are peculiarly fitted. There are no holidays in public hospital service. This means that, in many public hospitals, the number of nurses must be increased so that an undue burden may not be put upon any. That type of so-called economy in public institutions which results in keeping the numbers of nurses below that necessary to permit an equitable division of labor is not economy at all, but waste. There is a growing demand for the adoption in nursing work of the eight hour day for nurses including student nurses. The only argument against this in public service is that it may compel a considerable increase of hospital budgets. Nevertheless, much can be done by public authorities at moderate expense to meet the demand for shorter hours in nursing work.

With respect to living conditions it is highly desirable that the nurse be given a place to live outside of the institution where she can have that rest, recreation, and pleasant environment which she needs and for which the hospital itself it not suited. This means the maintenance of a home for nurses near the hospital, but far enough away from it to give the nurse off duty freedom from the sights, sounds, and smells of the hospital. The best hospitals, public and private, do provide such homes for nurses but there are still many public institutions where the inadequacy of housing facilities for nurses constitutes a real handicap to the maintenance of good morale.

3. Raising the standards of nurse compensation both in public institutions and in other public services where nurses are utilized will do much to attract trained nurses to public service. As already noted, nurses employed by private hospitals and private health nursing organizations are generally better paid than those employed in public service. In both types of nursing service, salaries are lower than in most other professional employments calling for as high personal qualifications and there is considerably less opportunity for promotion and salary increases. The establishment by public authorities of higher minimum salaries for qualified trained

nurses and a definite system of salary increases up to a reasonable maximum based on length of satisfactory service is indicated. The assurance of an annual increase of salary, even if the initial salary is relatively low, is far more attractive than a higher initial salary without any assurance of later increase. Fifteen hundred dollars per year may well be regarded as representing a fair minimum and $2,000 to $2,400 the maximum for the rank and file of graduate nurses in public employment. If they are given maintenance, their salary payments should be adjusted according to the value of maintenance provided.

4. As far as funds and circumstances permit, public authorities should adopt such basic standards of training school organization, curriculum, equipment, and management as have been endorsed by the Committee for the Study of Nursing Education in the United States which was first established in 1919 by the Rockefeller Foundation and published in its final report in 1923. The recommendations of this report are the result of a most thorough inquiry and merit careful study by public authorities and students of public administration.[2]

Among the recommendations of this report worthy of special consideration is the elimination from the work of student nurses of all possible duties that can be better and more economically performed by lay workers, such as cleaning, dusting, care of linen, serving meals, and other routine work that has little educational value. By confining the duties of the student nurse to those essential to her training in nursing theory and practice, and by the adoption of other measures for economizing nurses' time, it may be possible to reduce the length of the student course from the customary three years to about three-fourths of that period. Shortening the course of training and the elimination of the many routine duties of nurses that are the merest drudgery would undoubtedly help considerably to make public service more attractive.

5. Finally, it is of the highest importance that the organization and administration of the public hospital and training school be such as to prevent overemphasis on the utilization of student nurses for ward work. The exploitation of student nurses by public hospital officials in order that salary costs may be kept low is

[2] Committee for the Study of Nursing Education, *Nursing and Nursing Education in the United States* (Report of Committee Appointed by Rockefeller Foundation, 1919).

by no means rare. One common cause of such exploitation of student nurses is the domination of hospital administration by medical boards and staffs whose members are usually more interested in the utilization of student nurses as medical aids than in the education of nurses. In this connection the recommendation for the establishment of a special advisory committee on nursing education and the divestment of the medical board and staff from any responsibility for the program of nursing education is to be emphasized.

Home Visiting Medical and Nursing Service

In large cities provision is usually made for the medical and nursing care of certain of the sick in their homes. The traditional method of providing such medical relief, and the one still followed in many cities, is for the city government to employ one or more salaried "poor physicians" to treat such of the sick in their homes as cannot be cared for in hospitals, dispensaries, or other treatment institutions. Sometimes the poor physicians are under the direction of the health officer; sometimes they are under the direction of poor relief officers; sometimes they are independent agents; and in a few cities they are designated as externes or outdoor physicians of a hospital staff.

In all large cities there is need for one or more physicians to treat the sick poor in their homes. These physicians should preferably be attached to the hospital or dispensary and regarded as members of the hospital or dispensary staffs. Since the duties of the home visiting physicians or hospital externes call for a considerable amount of their time, and are generally less congenial than those of physicians engaged in the indoor work of hospital or dispensary, the former should be paid salaries based upon their professional status and upon the nature and extent of the responsibilities which they carry. Where they are recognized as members of a hospital or dispensary staff and have the privileges to which such recognition entitles them, competent young physicians can usually be found for part time work at salaries of from $600 to $900 per annum. Where their appointments as home visiting physicians or poor physicians carry no special hospital or dispensary connections, salaries should be greater.

Nursing care of the sick in their homes is a phase of sickness treatment which has not as a rule been developed under the auspices

of municipal governments. In the past such work has been done mainly by private visiting nurse associations which are supported by citizen contributions and small fees charged those patients able to pay. The present tendency is, however, for city governments to take over a large share of this home nursing service for the sick poor. It is well nigh impossible, and certainly impracticable from the administrative point of view, to separate educational health nursing for disease prevention and bedside nursing of the sick. Public health nursing, as it is commonly understood, is educational and investigational in character. The child health nurse or the communicable disease nurse is not ordinarily expected to furnish practical nursing assistance in the homes she visits. Her chief function is to instruct the occupants of the home how they may avoid sickness and help them to secure treatment for it if treatment is necessary. But her influence as an advisor on sickness prevention is enhanced if she also contributes some practical service at the bedside. The nurse who visits the tuberculosis patient must, if she is to be of real use as an agent of prevention, furnish bedside care of the patient where that is needed.

If bedside nursing of the sick poor in their homes is necessary, and is not otherwise satisfactorily provided for, the city government may well employ trained nurses for this purpose. Since in nursing work the educational preventive work of nurses as agents of a health bureau or department is so closely related to bedside nursing, it seems highly desirable that these duties, preventive as well as curative, be performed by a single nursing corps which preferably should be a unit of the health department or bureau. Provided there are sufficient nurses to permit a proper districting of the city, the health nurse within her district should provide both educational and bedside nursing service. This subject has been discussed in greater detail in Chapter XI, on child hygiene and public health nursing to which the reader is referred.

In any event, whether bedside nursing is provided by the city government or by private agencies, there should be the most complete coöperation between the nurses engaged in this work and the medical officers of the government who are also concerned with home care of the sick. Without such coöperation the medical treatment of the sick in their homes will be likely to become a more or less routine and unsympathetic performance. The tactful trained nurse, coöperating with the physician, can often secure

results in the adjustment of a sickness problem in the home which could not be secured by the physician alone. The nurse commonly has a less detached point of view and a somewhat broader interest in the domestic situation in the home than has the physician who has to consider not only the need of the indigent sick person but the demands of his private practice as well.

Summary of Major Features of the Administration of Medical and Nursing Services in Public Hospitals

It must be recognized that there are no hard and fast rules which can be applied willy nilly to the administration of the medical and nursing services of public hospitals. Local conditions, political and otherwise, may make it impracticable to abandon established systems of organization and administrative practices even though these are admittedly unsound in their essentials. But leaving out of consideration the many limitations to administrative efficiency which such local conditions impose, it is, nevertheless, possible to define the major features of administrative policy with respect to professional services for the care of the sick. These features which have been discussed in detail in the preceding paragraphs are for the sake of emphasis recapitulated as follows:

1. There should be no deviation from the well established rule that administrative responsibility for public hospital management should be centered in a single competent director with no board, medical or lay, intervening between him and the head of the city government.

2. For advice on matters of medical policy and professional medical relations the director of the hospital should depend upon a medical board appointed by the head of the city government. This board should be responsible also for the selection, organization, and supervision of the volunteer (unpaid), attending medical staff of the hospital and the maintenance of proper standards of professional medical practice and conduct in the hospital.

3. The organization of the volunteer attending medical staff of the hospital (and dispensary, if there is one), should provide for a graded service through which the attending physicians may pass from the lower to the higher ranks as they acquire experience and skill. The general direction of the work of staff physicians should be provided by chiefs of service who remain continuously on service throughout the year. Except for such chiefs of service, attending physicians should serve by groups in rotation so that as

many as possible of the practitioners of the community may be given opportunity to serve on the hospital staff. When the dispensary is part of the hospital, there should be one graded staff for both hospital and dispensary.

4. Training schools for nurses should be maintained by public authorities as a part of or affiliated with all public general hospitals capable of meeting approved standards of nursing and nursing education, and provision should be made as far as possible in such schools for the training of student nurses in all fields of public health endeavor, preventive as well as curative.

5. The administrative direction and control of the nursing organization, including the training school, should be centered in the administrative head of the hospital but under the technical direction of trained nurse superintendents responsible directly to him. In no case should the medical board or staff of the hospital be permitted to interfere in administrative matters having to do with nursing organization, functions, or personnel.

6. For the development of the educational policy and program of the training school for nurses, a committee on training school should be appointed by the hospital authority as its advisor in these matters. Such committee should include the administrative head of the hospital; the superintendent of nurses, and the superintendent of training school, ex officio, representatives of the medical board and staff, and other men and women familiar with the problems and needs of nursing education.

7. In all matters other than these specifically mentioned relative to hospital nursing organization and procedure, and training school operation and maintenance, including the length of the training, courses of study, hospital duties, housing, compensation, etc., of student nurses, the standards approved by the Committee for the Study of Nursing Education should be adopted by public hospital authorities, as far as it is practicable to do so.

CHAPTER XX

HOSPITAL RECORD KEEPING AND ACCOUNTING

Since the treatment of sickness is the essential function of the hospital, it is clear that good management requires the keeping of records of patients and their treatment, which will show not only who was treated and why, but what kind of treatment was given and what it accomplished. The general hospital statistics of patient care are built up from the records of individual patients. It is necessary that a complete record be made for each patient covering not only his illness and its treatment, but all other circumstances which may have a bearing both upon the nature of the activities of the hospital in his behalf and upon the general community program of public care of the sick.

The record of the sick patient whether cared for in the hospital, in the dispensary, or otherwise, at public expense, should serve five chief purposes, as follows:

1. To determine the nature and extent of the responsibility of the government to provide for the treatment of the patient at public expense, so that the public may be protected against unwarranted expenditures of public money.

2. To protect the patient and the public against any abuse of authority or negligence in the treatment of the patient, and, conversely, to protect public authorities against unjust charges of abuse or incompetence.

3. To provide such information regarding the social and economic circumstances of the patient, the nature of his illness, and the methods of his treatment as will guide physicians and other professional attendants in their treatment.

4. To make possible statistical analysis, research, and report to the community on the service rendered by the public agency, the need, if any, for service extensions or betterments, and the relation of costs to results.

5. To make available for medical research, such information about the causes, manifestation, treatment, and results of treatment of disease as will aid in the advancement of medical science.

No record of a public patient which does not meet these requirements can be regarded as a satisfactory record. No public sickness treatment agency which does not insist upon records which will serve these purposes can be regarded as fully competent, no matter how good the treatment of the individual patient. We emphasize the words "public agency," in this connection, because of the clear responsibility of public hospitals and other sickness treatment agencies to justify their expenditure of public money, and to make, through such expenditure, a define contribution to the welfare of the community as a whole.

The Patient "History" and Its Contents

The record of the patient, or patient "history" as it is called in hospital practice, should start with his application for treatment and end with his death or discharge from supervision by the hospital or other treatment service. Its contents may be briefly summarized as follows:

1. The facts necessary for identification of the patient, such as, name, age, sex, occupation, residence, etc., and such other data regarding his nationality, civil, social, or religious status, etc., as may be necessary for statistical research or reference.

2. The facts bearing on the eligibility of the patient for care at public expense, including his "settlement," as defined by law, his economic circumstances, and other information necessary to safeguard the expenditure of public funds in his behalf.

3. The circumstances of the patient's illness and his physical and mental state, including such collateral information regarding his personal history, family history, and social contacts and relations, as may be required for diagnosis and treatment.

4. The nature of the treatment given the patient, and the results of it, including the names of those responsible for treatment, and such special information on the conduct and reactions of the patient at all times, as may be desirable for the protection of the patient, the public, and those responsible for the patient's treatment and general care.

5. The findings with respect to the physical and mental condition of the patient on discharge, whether discharged by death or otherwise, including the record of post mortem examination, if any.

6. The facts, as far as ascertainable, about the after care of the patient, whether at home, in a dispensary, or other treatment institution, and the final outcome.

Since the hospital is the chief unit of the community sickness treatment service, we shall consider the records of patient care in their application to the problems of hospital service only. The principles governing the recording of facts about treatment of the sick are, however, essentially the same for all types of treatment service.

In the compilation of the patient record as outlined, various elements of the hospital service are called upon. The recording of facts necessary for patient identification, to establish the eligibility of the patient for treatment at public expense, and to determine his general social and economic status should be made preferably by trained social service workers. More is required than mere interrogation of the patient. The statements which he may make on admission must be checked by inquiry at his home, his place of employment, and elsewhere. In many public hospitals, however, the practice is merely for a registration clerk to interrogate the patient and to accept such evidence about his circumstances and needs as may be furnished voluntarily by friends, associates, or medical attendants outside the hospital. This is not a satisfactory procedure, because the accuracy of information so obtained is open to serious question. It is, however, the business of the admitting office, whatever the qualifications of its investigators, to record these data.

The records of the physical and mental condition of the patient on admission, the course of treatment given and its results, the patient's condition on discharge, post mortem findings, and after care information should be made by various members of the staff of professional attendants, as physicians, nurses, pathologists, laboratory technicians, social workers, etc. To this end, there is, in the best organized hospitals, a committee on hospital records of the attending medical staff, whose business it is to see that records are completely made out and in accordance with recognized standards of history record keeping. In this connection, the special significance of ambulance records should be pointed out. In cases of acute illness or injury, the ambulance surgeon is often the first member of the hospital staff to have contact with the patient, and the record which he may make on the spot is of extreme importance, not only in determining the course of later treatment, but furnishing information which may be needed by the police, public prosecutors, the courts, and other agencies for the protection of lives and property. Failure on the part of an

ambulance surgeon to make a complete record of his findings is a serious omission, but a quite common one.

When the patient's record is completed through his final discharge from the hospital, or from dispensary oversight, or at death, all of the various parts of the record should be brought together in a single volume, properly indexed, and filed. In the larger hospitals, it has been found desirable to employ a librarian, who has final authority for the indexing, filing, and control of patient histories. It is the business of the librarian, before receiving a patient history for indexing and filing, to see that it is complete and in the approved form. If it is not a complete and accurate record, it should be returned for correction to the person or persons responsible for errors or omissions. When finally approved for record, it is indexed by the librarian in whatever way may contribute best to its use by the hospital. Patient histories are usually indexed by name of patient, date of treatment, etc., so that they may be readily found. They may be cross indexed for any other reference or statistical purpose, as by age, occupation, mental condition, nationality, disease, injury, or what not. Unfortunately for hospital statistics, standards of patient history keeping have not been generally adopted, although the American College of Surgeons has recommended them, and considerable progress toward uniformity has been made.

It is the business of the hospital management, whether or not it is fortunate enough to have a skilled librarian, to see that hospital records are properly made and kept. The consequence of failure on the part of the hospital superintendent to insist upon completeness and accuracy of records is sometimes not only a serious handicap to the work of physicians, but costly to the public. There is plenty of evidence in the court records of damage actions brought by patients against public authorities, where verdict has been rendered for the plaintiff because of the failure of the hospital authorities to submit proper records of the patients' treatment.

Practical Uses of Patient Records

There is probably no more reliable source of information about the health and welfare problems of a community than hospital records provided such records are properly kept and properly analyzed. Public hospital authorities have not only a more direct responsibility for the analysis and interpretation of patient records,

but also a greater opportunity in this respect than have private hospitals. The public hospital and dispensary should be regarded as a great laboratory for the examination of the human material with which it deals, and for the interpretation of community needs and resources which such examination permits. The very fact that the patient is a ward of the government gives the public hospital a clear mandate to inquire thoroughly into all circumstances which have a bearing upon the reasons why public aid is needed, and the status of the individual patient in community life. If the public agency fails to accept such responsibility, it is not measuring up to its opportunity for the promotion of community welfare.

Taken alone, many of the facts included in an individual patient record would have relatively little significance, but taken as of the entire group of patients and in connection with their diseases and injuries, these same facts may have great significance. For example, it would be of no great importance, perhaps, to the community to know that a single patient, a painter, let us say, was a victim of lead poisoning and likely to die or be permanently handicapped as the result of the disease. But if in the classification of patients by occupation and by disease, it were discovered that there were many cases of lead poisoning and other industrial diseases among patients employed in the manufacturing plants of the community, the need for a definite program of industrial disease prevention might be indicated. Or it would be perhaps of no great significance to know that one woman was in the hospital as the result of inadequate care during pregnancy and labor, but if it were shown that many women became hospital patients because of improper care during pregnancy and at birth, or because of their lack of any care whatever, the need of definite measures for their protection would be shown. The mere fact that a syphilitic or tuberculous patient is a cook might mean little as regards the individual case, but if, among all syphilitic or tuberculous patients, there were many who were food handlers, the need of better provision for the protection of the community against food contamination by such persons would be apparent. These are but a few of many illustrations that might be cited of the value of statistical research in hospital records for purposes of determining community needs.

As we have said, there are as yet no satisfactory standards of patient record keeping which are of general application. The forms of records do not, however, differ widely and their content

is much the same in the better hospitals. A major difficulty, however, in making comparisons of hospital work and results in different communities, is that there is no simple uniform system of disease nomenclature that may be used by all for reporting purposes. It is obvious that unless "influenza," for example, means exactly the same thing in one hospital as in another, we cannot compare results of treatment of this disease intelligently. Some of the largest municipal hospitals have adopted, for purposes of statistical analysis, a disease and injury nomenclature which conforms, in its major features, to what is known as the Bellevue Hospital Nomenclature, as developed in Bellevue Hospital in New York City. This system of nomenclature is, however, a very completely detailed one, and for small hospitals to use it satisfactorily might require a prohibitive outlay for record keeping and indexing. But, it is probable that before long we shall have, as the result of the efforts of the American College of Surgeons, a nomenclature of sickness, which will permit satisfactory comparison of the sickness demands upon hospitals and the results of treatment. It would be of great value to a superintendent to know that in the treatment of a particular condition of disease or injury, the mortality of his own hospital was, let us say, 10 per cent of cases, while that of another comparable institution was only 5 per cent. But as we have said, comparisons of this kind depend upon uniformity of nomenclature, and standards have yet to be developed and applied generally.

A recent classification of the cause of sickness prepared by a committee of the National Industrial Conference, primarily for use in recording sickness among industrial workers, is a forward step toward uniformity in sickness nomenclature. This classification is based on the International List of the Causes of Death, and might well serve as a basis for similar classification of diseases and injuries for hospital record purposes.[1]

There is much other information of value in management which a hospital superintendent may discover from analysis of his patient records. Mere numbers of patients and the variations in demand for hospital care at different seasons, or in different years, may indicate desirable changes in the arrangment of his bed capacity or in assignment of his personnel. The use of hospital facilities

[1] *The Classication of Causes of Sickness* (Tentative List), Report of Committee of National Industrial Conference, Reprint No. 1006, from Public Health Reports, April 24, 1925.

by certain classes of patient according to age, sex, economic conditions, etc., may also point the way to changes in organization and procedure.

From the point of view of the physicians and other attendants, the use of patient records will depend, in a large measure, upon what facilities for such research may be made available to them. If records are carelessly prepared and carelessly indexed and filed, no use is likely to be made of them. If, on the other hand, the physician who wants to study the results of operation procedure in appendix cases, for example, can have placed at his disposal, a complete file of the records of patients who have been treated for appendicitis with all facts about them and their treatment, his interest in research will certainly be stimulated. Good medical work, in public hospitals particularly, has been handicapped seriously by the failure of hospital authorities to encourage interest in medical research, but medical research cannot be stimulated except there is a determined effort on the part of the superintendent and his medical staff to provide the material for research, namely, complete and detailed records of patients.

The following extracts from reports on public hospital services are illustrative of common defects in record keeping procedure:

No records whatever are made of the condition of the patient on entrance to the hospital, nor is there any record of later physical examination. In the case of operations performed, there is no record of the time required for operation, the extent, exact nature, and particulars of operation, the amount of anaesthetic used, or any of the facts necessary, not only for the protection of the physician and the hospital, but also for reference in the event that the person needs hospital care later on. In the records of maternity service, the same conditions were found. No records were available to show the condition of the patient on admission, the time required for delivery, whether or not abnormal labor was found, the results of obstetrical operations performed, or any of the data which a properly conducted hospital should keep.

The importance of such records should not require definition, but it may be said that it is absolutely impossible to tell what the results of hospital services are without them. Nor has the hospital any logical ground for defense in the event of a damage suit for improper treatment—by no means an uncommon thing. Furthermore, there are no data of scientific interest available to the physician or surgeon who might desire to make a study of certain groups of cases. One of the greatest services which a hospital can render to the com-

munity is in placing data regarding the care of the sick at the disposal of physicians.[2]

Although there are many patients at the city home who are confined to their beds, no medical histories are kept of these patients. The orderly states that he follows out the doctor's orders in medicating patients, but there are no records to show what the doctor has ordered. In other words, the orderly depends largely upon his memory or upon such casual notes as he may take when the doctor is making rounds. This method should be discontinued. The orderly should keep an order book in which he should write the directions which the doctor gives, and the doctor should sign his name to the day's orders. In this way, it would be possible to fix responsibility for an error in medication or for failure of the orderly to give medicine as ordered.

The medical history which should be kept for each sick patient should show all facts about the preliminary and subsequent examinations, the medication given, laboratory tests, if any, operative procedure, etc. If the institution performs hospital functions—and the city home is indeed a hospital for many inmates—there should be a complete record made of all that happens with reference to the patient just as in all good hospitals.[3]

Records of the hospital ambulance service are of no value. The following records taken from the ambulance record book are typical and show clearly how incapable of proper analysis such a record is.

2-24-14 Cronin, 3.30 p. m. Bunson, 1952 Champa.
2-25-14 Oleson, 9.10 a. m. Health Department, 1217 Ames.
2-25-14 Walker, 4.00 p. m. Perkins, 1018 13th St. Room Wey.
2-25-14 2512 Larimer, Hobart.
3- 4-14 Pettit, P. M. Frazer, 2036 Larimer, Hobart.
3-15-14 John Cobey, 7.00 p. m. Welton, 3701 Wewatta.
4- 4-14 Bell, Lee, 9.00 a. m. County Farm.

The illustrations above given indicate the chief defects of the records, namely:

1. They are written in pencil and therefore easily altered.
2. Names of patients are incompletely and carelessly entered.
3. Time of departure of the ambulance only is stated. There is no record of the time of receipt of the call (except on the telephone operator's slips); no record of arrival at patient's address;

[2] New York Bureau of Municipal Research, *A General Administrative Survey of the City of Jamestown, New York,* 1917 (printed), p. 203.
[3] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Norfolk, Virginia,* 1915 (printed), pp. 384-385.

no record of time of return to the hospital. Even the time of departure of the ambulance from the hospital is sometimes omitted.

4. No information is given as to reason for ambulance call, what the ambulance surgeon found on arrival, or what he did.
5. The name of the person sending in the call is sometimes not completely given; sometimes it is wholly omitted.
6. The name of the ambulance surgeon who made the call is frequently omitted.[4]

The General Purposes of Accounting Records

The accounting records of the hospital should be designed to show:

1. The revenues of the hospital and the sources from which devired.

2. The expenditures of the hospital according to the various general and special service functions performed as medical service, nursing service, housekeeping, dietary, etc., and according to the general and special classifications of objects of expenditure as supplies, repairs, etc.

3. The costs of service per unit of work done or service rendered as cost per day's treatment, per patient meal, per kilowatt hour of electric current used, per mile of ambulance service, etc.

Since the revenues of the public hospital are in most instances only the appropriations made by the city government, no special revenue accounting records are necessary in the hospital, except advice from the chief financial officer of the government as to the amount of funds available, and, from time to time, advice as to the balance remaining for hospital purposes. It is not only unnecessary, but a waste of time for public hospitals to maintain appropriation accounts when the general finance department of the government is properly organized and properly functioning for this purpose. If, however, the hospital receives certain moneys from paying patients and other sources, it should keep a record of the sources, dates of payment, and amounts thereof, which may be forwarded with the moneys collected to the city treasurer as required.

Expenditure accounts also need not be kept by the hospital where the general finance department is properly organized.

[4] New York Bureau of Municipal Research, *Report on a Survey of Certain Departments of the City and County of Denver, Colorado,* 1914 (printed), pp. 115-116

Expenditures should be made by the hospital according to the approved schedules of appropriations. On the performance of service or delivery of goods for which expenditure is authorized, bills therefor properly endorsed by the hospital authority should be forwarded to the comptroller for his audit and approval for payment by the city treasurer.

The records of expenditure in whatever form desired by the hospital superintendent may then be kept in the finance department of the city government. Such information as may be needed by the superintendent on expenditures should, of course, be made available to him on demand. The head of the hospital will probably need to develop the special form of expenditure statement to be kept in the general city accounting office, in order that he may have the statement when he needs it in such form as to permit him to determine unit costs.

Cost Accounting and Its Importance in Management

The determination of unit costs represents the most important phase of public hospital accounting in its relation to management. It is obvious that no matter how much money is spent, the result of expenditure cannot be determined except the expenditures be shown in terms of work performed. For example, the mere fact that a hospital spent $100,000 for maintenance and operation during the course of a year means nothing unless one knows, first of all, how may patients were actually cared for, or better, how many days of service were actually rendered patients. In other words, to derive a cost figure that will have real significance in this case, we must find out how much it cost to provide one day's treatment per patient. To illustrate: if the hospital spending $100,000 during the course of the year, cared for 2,500 patients, and these 2,500 patients were furnished with 25,000 days of hospital service, the cost per patient day (the standard unit of hospital cost) would be $100,000 divided by 25,000 or $4 per patient day.[5]

[5] It should be noted in this connection that total cost of maintenance and operation should not include extraordinary expenses, as for large items of equipment or alterations and improvements, the life of which extends over several years. It would be proper, if the life of the equipment or improvements can be ascertained, to allocate a proportionate share of its costs to any given period, but usually these items are left out of general "maintenance and operation." The aim is to consider under this head only the cost of those services, personal and other, which are actually used, or commodities actually used up during the given period.

Thus far relatively little has been done to develop unit costs, other than patient day cost, which will really measure quantity of service. Several public hospitals have, however, subdivided the general patient day cost so that it reflects patient day cost for each of the various objects of expenditure or for each of the various hospital functions. For example, if $10,000 of the total $100,000 was spent for food, the patient day cost for food would be calculated as 10 per cent of the total patient day cost of $.40 per patient day. Or, if the total cost of all activities of the dietary function, including salaries and wages, food, fuel, etc., were $20,000 or 20 per cent of the total cost, the patient day cost for dietary would be calculated at $.80. But this mere separation of the total patient day cost into its component parts, as by organization units, or classes of commodity, is not true cost accounting, because the unit which is used does not indicate production or performance. In the case of dietary, the unit of production is the meal. Knowing the total number of meals served to patients and to employees, and the total cost of dietary service, we might then determine the unit cost per meal served for both patients and employees, or for each group. This would be a true unit cost figure, extremely valuable to the superintendent as a basis for comparison of one period with another. Similiarly, it would be of little value to know that of the total patient day cost of $4. the cost of operating the ambulance was only 2 per cent or $.20 per patient day, as compared with $.30 per patient day in a previous period,—unless one knew also how many miles of ambulance services were furnished in each period. In this case, cost per mile of ambulance operation or cost per ambulance service hour might well be taken as the unit cost to be determined, and comparison of costs per mile or per service hour for various periods would give the clue to the relative efficiency of ambulance operation in the periods considered.

The number and variety of unit costs of hospital service which may be developed for purposes of management is limited only by the ability of the superintendent to obtain, through service records and reports, accurate information as to work performed. Cost per nursing hour or day, cost per operation hour for operating room service, cost per prescription issued by the pharmacy, cost per laboratory test, cost per X-ray plate, and a great number of other useful cost figures can be and should be developed by hospital superintendents. When finally standard procedures of

cost accounting have been generally adopted, comparisons of hospital costs can be made intelligently. Until such time, however, the mere comparison of patient day costs, no matter how minutely divided these costs may be by hospital organization units, functions, or things purchased, has little practical value in determining the comparative efficiency of hospital services. If we know that two or more hospitals are furnishing precisely the same character of service, comparisons of their general patient day costs may have some slight value. There are, however, many variables in hospital service that are not reflected in the general patient day cost.

As we have said, the number and variety of unit costs which may be determined is practically unlimited, provided only there is a well organized system of expenditure accounts, and an adequate record of work performed by the various branches of the hospital service. A few of the many of practical value in determining hospital efficiency are:

1. Patient day cost;
2. Cost per meal served, to patients, to employees, or to both;
3. Cost per day or per hour for nursing service of graduate nurses, of pupil nurses, or both;
4. Cost per operation performed, major, minor, or both, or cost per hour of operating room use;
5. Cost per laboratory test or examination;
6. Cost per X-ray plate or X-ray examination, or cost per hour for use of X-ray equipment;
7. Cost per mile of ambulance service or per hour of ambulance use;
8. Cost per pound of linen laundered;
9. Cost per patient visit to dispensary or cost per visit to patients who may be cared for in their homes through a home visiting medical service;
10. Cost per patient for investigation and other service by social workers;
11. Cost per patient for work performed by registration office on admission and discharge of patients;
12. Cost per kilowatt hour of electricity, per cubic feet of water supplied, per heat unit of fuel used, etc.

Such unit costs would be of no value for comparing one hospital with another unless the same factors entered into each cost. It is further practically impossible so to standardize conditions of hospital operation that the same factors shall have the same weights

in institutions differently situated. But if the same procedure of determining unit costs in one institution is carried on in that institution for several years, it is quite possible by comparison of unit costs to obtain valuable information on the relative efficiency of the hospital's work in these years.

Expenditure Schedules and Their Preparation

In preparing expenditure schedules which will be usable for purposes of cost accounting and financial management, two purposes must be considered. The first is that the expenditure statement shall show how the total expenditure is distributed according to the various activities or functions of the hospital; and the second, how it is distributed according to objects of expenditure. In other words, the classification of expenditures should be first made by functions in as much detail as necessary, and then for each class of commodity or thing used in the performance of each of these functions. For instance, the expenditures of a hospital should be first grouped under the general functional heads representing the organization, such as, general management or administration, professional care of patients, general plant operation, housekeeping, dietary, stores keeping, etc. Under each of these major heads expenditures should be classified according to salaries and wages, supplies, equipment, repairs and replacements, insurance, contractual service, if any, as light, heat, power, water, etc. Each of the major functional headings may be subdivided into smaller activity groups, and the expenditures by each special activity group and by object may be shown. Housekeeping, for instance, may be subdivided so as to show all of the various activities included under this functional head, as laundry service, cleansing of buildings, care and repair of linen, etc.—and under each one of these activities the expenditures for supplies, equipment, etc., may be scheduled. Further subdivision of expenditures according to special subgroups of the general object groups may be made. Supplies should be subdivided according to their various uses, as food supplies, fuel supplies, laundry and cleaning supplies, motor vehicle supplies, printing and stationery supplies, etc., and the expenditure for each supply type shown.

Whatever may be the functional organization of the hospital and the method of distributing expenditures for cost accounting purposes by functional units or subdivisions of such functional units, the classification of expenditures by objects under each

functional or subfunctional head should follow the city's general budget and accounting classification. The simple classification by objects of expenditure already adopted in a number of cities for budget purposes, is outlined below.[6]

1. *Services—Personal,* which includes the direct labor of employees of the city government.

2. *Services—Contractual.* This class includes all work performed for the city government by persons who are not employees of the city, the work involving both labor and the use of equipment or the furnishing of commodities under express or implied contract. It may be subdivided into communication and transportation; subsistence, care and support; printing, binding and advertising; heat, light, power and water; repairs, etc.

3 *Commodities,* which includes all supplies, materials, and repair parts.

4. *Current Charges,* covering those expenditures that may be contracted annually at the option of the city authorities. It includes rents, insurance, refunds, registrations and subscriptions.

5. *Current Obligations.* This class sets up the fixed charges resulting from financial transactions previously entered into by the city authorities. It includes interest, pensions and retirements, grants and subsidies, and taxes.

6. *Properties,* including lands, buildings, fixed improvements, and equipment which has a calculable period of usefulness.

7. *Debt Payments,* which contains those expenditures for the redemption of the city's debt. Institutions rarely make such expenditures directly.

The classification by objects of expenditure, as above outlined, can be considerably simplified for purposes of accounting control since many of the special items included will not be used in hospital operation and maintenance. If the hospital budget is properly classified by major functions and objects according to some well conceived general budget plan for all city departments, the hospital's expenditure accounting statements should follow such budget plan. If the budget of the hospital is not so classified, the superintendent will need to develop a system of accounts according to the general plan suggested with such modifications as may be indicated to meet his particular needs. But as previously stated, the accounting books and records should be main-

[6] See *Municipal Finance* by A. E. Buck and others, published by Macmillan, 1926, pp. 59-71.

tained in the general accounting offices of the city government for his review as required. No special accounting staff will need to be maintained in the average city hospital. Unless it be an unusually large hospital, the superintendent can himself make such analysis of cost data as is necessary for his information.

The following excerpt illustrates the defect of accounting records for cost accounting purposes in a centrally managed group of institutions of a department of health, where uniformity of accounting procedure was not required, although easily possible because of their central control.

In the various institutions under the control of the department where there exist almost identical bases of expenditure, the segregation of expenditures shows the widest variation.

At the San Francisco Hospital, for example, the following classification of accounts is made:

Office expenses
Surgical instruments
Surgical and medical supplies
Garage
Housekeeping
Coal
Kitchen
Bread
Groceries
Milk
Butter and eggs
Fruit and vegetables
Meat and fish
Fuel oil
Maintenance of grounds and buildings
Laundry
Electrical and lighting supplies
Engine room and plumbing supplies
Miscellaneous
Salaries

At the Isolation Hospital the classification is as follows:

Food supplies
Drugs
Clothing and dry goods
Janitorials and laundry
Fuel
Transportation

Equipment
Buildings and ground
Salaries

At the Emergency Hospitals still another classification is made:

Subsistance
Surgical and medical supplies
Motor ambulances
Fuel gas
Linen
Miscellaneous

At the Relief Home the classification is:

Subsistence
Sundries
Clothing and bedding
Power plant
Drugs
Laundry
Stables
Dairy
Farm and garden
Fuel
Repairs, ordinary
Repairs, wagon and harness
Repairs, machinery
Repairs, automobile
Garage (oil, etc.)
Permanent improvements

It will be noted that while the needs of the various institutions are much the same as regards food supplies, medical and surgical supplies, linen, laundry supplies, etc., the classifications of accounts vary so widely that it is profitless to attempt to compare costs in those institutions. It is, therefore, urged that a uniform classification be determined upon which will meet the needs of all institutions and that this be followed in all cases.[7]

Control of Supplies Essential in Hospital Accounting

Next to salaries and wages the largest item of cost in hospital operation is for supplies. There is, however, perhaps even greater opportunity for waste or misuse of public funds in the use of supplies than in the use of personal service, because the evidences

[7] New York Bureau of Municipal Research, *Report on a Survey of the Government of the City and County of San Francisco, California,* 1916 (printed), pp. 396-397.

of waste or misuse of supplies are not as apparent. Nor is the handling of supplies subjected generally to such careful scrutiny by appropriating bodies as are the numbers of employees and their salaries. There is probably no public institution or agency that purchases a greater variety of supplies than the public hospital, and few in which the supply items require a larger proportion of their total budgets. The hospital buys food, fuel, clothing, drugs and other medical and surgical supplies, linen, stationery, glassware and china, paint, oil, gasoline, cement, soap and disinfectant, brooms and brushes, plants and seeds, in fact, almost every kind of thing that may be used in the care, custody, treatment, entertainment, and education of human beings.

It is essential in control of supplies or things "that can be used but once or which show a material change or appreciable impairment of their physical condition," that three general methods of supply control shall be applied, namely:

1. The supplies purchased should be such that their use will give greatest value per dollar expenditure.

2. Supply use should be so regulated and controlled that the right things are used for the right purposes and by the right persons, and that complete records are kept of supply use.

3. All possible measures should be carried out for the salvage and reuse of supplies not wholly consumed at first use.

Generally, the hospital directorate takes personal responsibility for purchasing, except in such cities as maintain central purchasing offices for city government as a whole, or for special groups of public service enterprises. But whether or not responsibility for purchasing is vested in the hospital head, it is the business of the superintendent to insist upon purchasing for hospital use only those supplies which conform to certain standards of quality and usability in their relation to cost. He may not be able within the limits of his appropriation to have the very best, regardless of price, but he must be prepared to buy or recommend the buying of the best available for the money in hand. If the superintendent himself is primarily responsible for purchasing and elects to determine for himself in every case where, what, and at what price he can purchase most satisfactorily, he will need to give more than mere casual thought to the matter. He will need to equip himself for purchasing by thorough study of hospital supply standards, as far as these have been developed, and to maintain constant contact with supply markets if the supply quanti-

ties needed are large. When the supply needs of the hospital are small, and can be met locally, the problem is a relatively simple one, but for large institutions, purchasing, if properly done, will require considerably more time and attention from the superintendent than he can conveniently give it without neglecting other important matters of management.

If, in the given community, there is a large number of institutions using the same general classes of supplies, the purchasing for all can be better done by a single skilled purchasing agent who can study carefully the needs of all, coöperate with the heads of the institutions in setting up uniform standards, and purchase for them according to their needs in large quantities. Better prices can usually be obtained in this way for goods of higher standard than can be had through purchase in small lots by the individual institutions. The hospital bureau of standards and supplies, originally established in New York City to serve four of the large local hospitals, has been in operation since 1910. It has been so successful as a hospital purchasing bureau that other hospitals throughout the country have sought its service, and to-day it does the buying for more than one hundred hospitals, the great majority of which are located outside of New York City. The hospital bureau has developed standards on the basis of actual test of supplies, and at present fifty standards have been adopted covering as many different types of supply.

Where the number and size of institutions under municipal control are great enough to make quantity purchasing desirable, centralized purchasing is undoubtedly the most satisfactory plan, provided satisfactory supply standards are used. The savings, through centralized purchasing, are clearly dependent upon the adoption and use of such standards in quantity buying. Centralized purchasing without supply standards has no great advantage over individual and independent purchasing by hospital superintendents.

A properly organized system of supply control requires, first, a competent storekeeper, who alone shall be responsible for stores keeping and for the distribution of stores to using officers or employees, and second, a storeroom properly arranged and equipped for the care and conservation of supplies. Unless there is a single officer or employee with responsibility for the storage and distribution of supplies, it is impossible to check waste and misuse. Where responsibility is divided, everybody's business becomes nobody's business, and the complete records which should be main-

tained of supplies received, supplies used, and stock on hand are usually conspicuous by their absence. It is clear that any system of hospital cost accounting not based upon completely detailed records of where, and for what purposes, supplies are used will be of little value. Every disbursement of supplies from stores should be on the basis of requisition to the storekeeper, and this requisition, when filled by the storekeeper and receipted by the using officer or his agent, should be retained by the former as evidence of use. It is not necessarily the storekeeper's business to say what, when, or how much shall be drawn from stores, but it is his business to furnish records to the superintendent which will show these facts and permit the superintendent to determine whether or not there is misuse or waste. He should be prepared also to keep the superintendent informed of the condition of his supply stock by prompt advice when supplies are low and in need of replenishing, and to this end he should maintain a perpetual stock inventory.

The well arranged, well equipped storeroom is an important element in stores control. When supplies are not conveniently stored for stock checking, not so stored as to conserve time in their disbursement to using officers, or not protected against deterioration by heat, moisture, insects, and vermin, etc., there is bound to be waste. Even under the most favorable conditions, there is likely to be some waste, but many causes of waste can be eliminated by very simple, common sense handling of supplies in the storeroom.

It may be desirable for the convenience of using officers to have several special storerooms in addition to general stores headquarters —such as drug supply rooms, linen supply rooms, kitchen and housekeeping supply rooms or closets. But no matter how many of these may be provided, they should all be controlled by the storekeeper, and issuances from general stores to these special storerooms should be covered by requisitions receipted by the officers in charge of them. Here again, the principle of undivided responsibility should be strictly adhered to.

Salvage of Supplies

Relatively little attention has been paid in public hospitals to the salvage of supplies. Considerable savings can be effected in the salvage even of such supplies as gauze and surgical dressings,

and in the largest and best conducted hospitals, washing and sterilization of these materials is routine procedure. Many articles of supply and minor equipment which, under incompetent stores management, might be thrown away after partial use, can, under good management, be restored to use, or otherwise salvaged. Even junk has its value, and good stores management requires that junk shall be under strict salvage control. Many storekeepers have adopted the procedure of refusing to issue new articles, such as kitchen utensils, dishes, linen, medical and surgical supplies, and minor equipment, until the old, broken, or otherwise damaged articles have been returned to stores. This is good practice, for when it is not followed there are invariably much greater losses through breakage, misuse, or misappropriation of supplies and equipment.

The application of the salvage principle in food handling is particularly important, and frequent examination of garbage cans may furnish the clue to extravagance in the use of food supplies. It is the business of the dietitian, or other person responsible for food service, to give careful scrutiny to the use of food and to utilization, as far as possible, of "left overs." The storekeeper, if he is skilled in his work, should be able to determine, on the basis of experience, approximately what the daily needs of dietary are; if he finds evidence of extravagant use, he should call it to the attention of the superintendent.

The following description of a system of stores control in a large municipal hospital outlines the general procedure desirable:

The general storekeeping service is under the immediate supervision of a commissary clerk at $1,800 a year. He is assisted by a storekeeper at $960, and two porters at $25 a month each.

All deliveries upon contract are checked at the scales by the commissary clerk in person. No shrinkage is allowed, and the weight and other specifications of supplies delivered must be absolutely as represented in so far as can be determined by inspection. It may be well to emphasize here, the need for more thorough examination and testing of supplies delivered upon contract. Each contract calls for certain very definite specifications of supplies, but there is no absolute certainty that the supplies delivered meet these specifications. There are many supplies for which ordinary inspection is insufficient, and for these laboratory tests are essential. No provision is made at present for such laboratory tests, although in several instances the

health department chemists have been asked to make tests for the various institutions of the department.

When the commissary clerk wishes supplies, he makes requisition on the superintendent in the prescribed manner. It is sufficient to say that the prescribed procedure is well carried out by the commissary clerk at the hospital. When these requisitions have been authorized by the superintendent and the demands have been made for payment and approved by the board of health, which is the final authority, the commissary clerk makes a record of the facts of the requisition, and segregates the expenditures according to a certain schedule which has been prepared especially for the hospital by the commissary clerk. It has been pointed out in the section of this report dealing with the organization and administration of the health department that the method of classifying expenditures varies in each of the institutions under health department control, and it was further pointed out that here should be uniformity of such classification, as far as possible, in order that the department may compare costs in its various institutions.

The storekeeper keeps a careful check upon all disbursements of stores. All requisitions upon stores must be signed by the head of the department or division needing them, and these orders must be countersigned by the superintendent. No new supplies or equipment are allowed unless evidence of need is furnished. In the case of minor equipment, old articles must be returned before new ones are furnished, and the superintendent, by his supervision and investigation of requests for supplies, makes it certain that such supplies are economically used.

The storekeeper keeps card records on which all stores transactions are entered. Each supply item has a separate card. As articles are received in the storeroom, the storekeeper enters the date and amount or quantity upon proper cards. As disbursed, entries are made upon the cards of the date and amount or quantity disbursed, and to what ward or hospital unit delivered. It is possible, therefore, by comparison of these records, to show the comparative consumption of supplies by the various hospital units. It has been suggested earlier in this report that a uniform system of stores records, based upon the system in effect at the San Francisco Hospital and Relief Home, be adopted for all health department institutions, the system at the San Francisco Hospital being essentially the same as that at the Relief Home.

The storeroom, which is under the immediate supervision of the storekeeper, is remarkable for its neatness, orderliness, and arrangement of stores. Every article has the proper place, and is kept in that place. Articles which might deteriorate if left exposed are properly covered. Racks and shelves are provided for those articles which

should be off the floor, and the whole picture is one of efficient storekeeping—a most important factor in economy of management.[8]

The Control of Drug Supplies

Among the most difficult problems of hospital storekeeping is that of the control of drug and other supplies used by physicians in the routine treatment of patients. These supplies are usually kept in a special storeroom, the drug room or pharmacy, which is under the supervision of a pharmacist. The orders of physicians and officer nurses are filled by the pharmacist on the basis of prescription or other requisition order. Ordinarily, the drug room is not regarded as a part of the general stores system, largely because of the feeling on the part of the hospital authorities that the dispensing drug supplies and remedial agents, because it has such close relation to the professional care and treatment of patients, should be freed somewhat from the domination of the lay storekeeper. There is, however, no valid reason why drug and medical stores should not be regarded as a part of general stores, and dealt with by the storekeeper in precisely the same way that he would deal with other supplies.

Where attending physicians are given a free hand in prescribing drugs and remedial agents in the treatment of patients, there is likely to be considerable waste of these supplies. The attending physicians may, and frequently do, ask for the purchase of preparations of a type and in quantities which subsequent use does not justify. Many times the writer has observed hospital drug rooms loaded down with proprietary preparations of one kind or another which have not been used, either because physicians changed their minds about using them, or because greater quantities were ordered than were required. There is invariably considerable deterioration of drug stocks, and good management requires that losses through deterioration as well as nonuse shall be prevented as far as it is possible to do so.

For the great majority of remedies used by physicians, the standard preparations of the United States Pharmacopœia should be compounded in the drug room or should be purchased as stock solutions for dispensing as required. The majority of the larger hospitals have adopted drug formularies to be used by attending

[8] New York Bureau of Municipal Research, *Report on a Survey of the Government of the City and County of San Francisco, California,* 1916 (printed), pp. 474-476.

physicians and nurses, which comprise mainly the standard prescriptions of the United States Pharmacopœia. Physicians are not permitted to prescribe whatever they may see fit, although, naturally, they are given reasonable freedom from the limitations which such a formulary imposes. Given a hospital formulary, a competent drug clerk or pharmacist to attend to the actual filling of prescriptions, and a storekeeper with authority to demand proper control of drug supplies and record of their use, it is quite possible to reduce drug costs considerably.

The following excerpt illustrates many of the defects common to the handling of drug supplies in small hospitals:

The drug room is under the supervision of the superintendent of nurses. Internes are allowed access to the drug room, and they go to the drug room and take such drugs and medicines as they may require. Sometimes, if the prescription is a large one, a record is left by the interne upon the file in the drug room, but ordinarily no record is left. If the interne needs pills, tablets, stock solutions, etc., he takes them without restriction.

The closet containing narcotics is kept locked by the superintendent of nurses, but in order that the internes may secure morphine, codeine, etc., when required, small quantities of these drugs are kept in another closet to which internes have access. The whiskey storeroom where surgical supplies are also stored is kept locked by the superintendent of nurses at all times.

Although the federal law relative to the dispensing of narcotics is very strict in its provisions and penalties, it is not enforced at the city home. No records are kept of the dispensing of such drugs as required by law. This is a very serious situation and should be corrected at once.

It is apparent that under the present procedure it is impossible to check waste, extravagant use, or even misappropriation, of drugs. It is not charged that drugs are misappropriated or misused, but it is a fact that loose methods of control make it possible. First of all, there should be some responsible person in charge of this drug room at all times, and a complete record should be kept of each prescription issued. Prescriptions should be put up by a pharmacist, not by an interne, who is not yet a graduate in medicine, nor by a nurse. The employment of a pharmacist would mean too great an expense for the small amount of dispensing done at this institution and this is not recommended at this time. It is recommended, however, that the attending medical staff prepare a formulary of the prescriptions best suited for city home needs. Such a formulary would meet all

needs except in acute cases where special medication might be demanded. The prescriptions listed in this formulary should be the simplest possible and the most economical, instead of allowing each physician to prescribe what he sees fit. The formulary system is not a new thing, but is in use in many of the large hospitals of the country, where considerably more work is done than at the city home. If such a formulary were used, it would be possible for the majority of prescriptions to be made up in stock, and these could be issued by the superintendent of nurses each morning. Such tablets, narcotics, and other items as physicians and nurses might require should be issued on requisition to the various wards where they should be kept under lock and key by the persons in charge of the wards. Physicians should secure emergency drugs from these sources and sign for them. When there is need of replenishing drugs in a ward, the person in charge should make a complete report to the superintendent of nurses, who may then issue additional quantities. There is no necessity for any one having access to the drug room except the officer responsible for issuing supplies.[9]

The Importance of Stores Control in Cost Accounting

As earlier stated, supplies represent a major item of hospital costs. If, then, the management wishes to know what the costs of various activities of the hospital are, the records of the use of supplies by the various using agents concerned with these activities must be complete in every respect. If the cost per mile for ambulance service is wanted, there must be a complete record showing exactly how much of each supply was used for ambulance purposes, when it was used, and what it cost. If the cost per unit of area in keeping the hospital clean is wanted the same facts about supplies used for this purposes must be recorded. Without adequate supply control records, it is not only impossible to know what service costs are nor to discuss intelligently the reasons why costs are high or low. It is easy enough to determine how much personal service costs for various activities if the organization is so defined and so directed that time records of employees in their various duties can be maintained, because salaries and wages are usually constant for monthly or yearly periods, but in the use of supplies, there are many more variables which must be taken into account. Prices change from day to day; the quality of supplies, and therefore their usability may vary; the efficiency

[9] New York Bureau of Municipal Research, *Report on a Survey of the City Government of Richmond, Virginia,* 1918 (printed), pp. 668-669.

with which the supplies are used by employees may vary considerably at different times and under different supervisory officers; seasonal changes must be taken into account, as well as the variations in the numbers of patients and the extent to which the hospital capacity is utilized.

The facts necessary for proper recording of supply use for purposes of cost accounting are these: (1) the cost per quantity unit of each supply used; (2) the total number of quantity units of each supply actually used for all purposes; (3) the distribution of the total quantity units actually used among the various using agencies according to their special activities.

The only satisfactory record of use is the record of issuance of the supplies from the storeroom. It is clear that at the end of any given period there may be some supplies in the hands of using agents which have not been used or are only partly used. If, however, issuance from stores is under proper control, the quantities issued for use in a given period will be determined largely by the experience of previous periods, and over issuance guarded against. If there is an over issue in considerable amount, it may be credited as unused, and in calculating unit cost for the period, the cost of the unused supplies in the hands of the various using agencies would be deducted from the total costs of supplies issued to them.

CHAPTER XXI

THE HOSPITAL'S FUNCTION IN COMMUNITY HEALTH EDUCATION

The primary duty of the public hospital is to provide as efficient care and treatment of the individual patient as is possible with the means at hand. A secondary, but none the less important duty is so to carry on its work that the interest of the patient and the community at large will be stimulated and utilized for the betterment of community health. In other words, the hospital should serve as an agency for community health education.

The contacts of the hospital with the community for health educational purposes, and the general program of education which such contacts permit may be outlined briefly as follows:

1. For the information and education of officials of government, who are responsible for the administration and financial control of health and welfare services generally, the hospital should publish reports and bulletins of work performed, costs, and results of hospital operation. These reports designed for official review should furnish such statistical and other summaries as will permit officials to appraise the value of work done, the adequacy of the hospital program, and the nature of the improvements necessary to meet recognized standards of hospital work.

2. For the education of the patient and his family, the hospital should maintain such relations, professional and otherwise, with them as will contribute to their better understanding of their own health needs, and better appreciation of their health opportunities as represented by the hospital.

3. For the education and training of professional attendants of the sick and other members of the hospital organization, the hospital should be so equipped and conducted that the efficiency of routine work will be promoted, scientific study of community health problems encouraged, and the individual and group coöperation of hospital workers in the common program guaranteed.

4. For the education of the community at large, coöperative

relations between the various organized groups of citizens, including medical and nursing organizations, chambers of commerce, women's clubs, labor unions, religious organizations, and all private health and welfare agencies, should be developed through good educational publicity on hospital matters, conferences between hospital authorities and representatives of such organizations, the establishment of representative hospital advisory or visiting committees, auxiliaries, etc. In addition, special effort should be made by the hospital to encourage the coöperation of citizens generally, by good publicity in the newspapers on current hospital problems, and to maintain the hospital plant and equipment in such condition that citizens will have pride in it.

The Hospital Report; Its Contents and Uses

It is apparent that unless a hospital has developed a system of record keeping and accounting which will reflect accurately the work done, its cost and results, hospital reports are not likely to prove of great informational and educational value either to public officials or citizens generally. Although the great majority of public hospitals do submit annual reports of one kind or another, relatively few of them present reports that will permit an intelligent appraisal of their work, even by persons skilled in the interpretation of hospital statistics.

The public hospital report should be designed to serve three major purposes as follows:

1. As an accounting to the officers of government and citizens generally of the use made of public funds.

2. As a source of reference and information for the use of health authorities, physicians, nurses, social workers, and others engaged in the promotion of community welfare.

3. As a source of research material for those interested in the promotion of more adequate care of the sick generally, through the development of uniform standards of hospital practice and procedure.

There are other minor purposes to be served by a hospital report depending somewhat upon local conditions and upon the relation of the public hospital to other government services, but these are of first importance.

That reports of public hospitals do not serve these purposes adequately is clear from even a casual review of the content of those which are published, and many public hospitals submit no

reports of their activities beyond the barest outline of their receipts and expenditures for the review only of controlling financial officers. Hospital reports designed merely to comply with legal or other mandates relative to accounting for the use of public funds cannot serve the purposes named. The report should be published in sufficient numbers to make it possible for those interested in its material to obtain copies of it. It should have its data so ordered and arranged that it can be readily interpreted by the reader, and compared with that of other like institutions. This implies the adoption by hospitals generally of standard report forms. A special committee of the American Hospital Association has developed certain standards of hospital reporting which will, if adopted, greatly improve hospital reports.[1]

As stated by the committee mentioned, "it is impossible to submit an outline of an annual report that will serve every hospital and every community." The needs of the private hospital with respect to reporting differ somewhat from those of the public hospital. The former has to report financial statistics relative to endowments, contributions, and receipts from paying patients which are not commonly a part of public hospital financial statistics, since the latter is supported wholly or mainly from tax revenues. The private hospital receives its support from income from endowments, public contributions in money and goods, receipts from paying patients, sales and other sources. It has, therefore, many acknowledgments to make with which the public hospital is not concerned. Briefly summarized, the content of a hospital report as recommended by the committee includes the following items:

1. Table of contents;
2. Names of board of trustess, officers, committees, auxiliary groups, etc. (applicable mainly to private hospitals);
3. List of attending medical staff (designating rank and service);
4. Acknowledgment of gifts (applicable mainly to private hospitals);
5. Report of president to board of trustees (applicable mainly to private hospitals);
6. Report of treasurer (in the case of public hospitals, this applies to the report of the accounting officer of the hospital or of that department of city government of which the hospital is a part);

[1] American Hospital Association, *Report of Committee on Hospital Forms Pertaining to Annual Reports,* Bulletin No. 50.

7. Report of administrative officer;
8. Statistical tables (including numbers of patients, total hospital days, deaths, surgical operations, per capita costs of service, and analysis of general service as to patient types);
9. Report of medical attending staff.

With reference to the publication of detailed statistics of professional work under this last head, the committee says:

The existing medical nomenclatures are not sufficiently comprehensive, and so lacking in uniformity that they do not serve with any degree of efficiency. Until a uniform nomenclature can be compiled through the collaboration of all allied interests your committee does not feel that any one of the existing systems can be recommended as standard. Therefore, we do not recommend the publication of professional statistics.

Your committee believes, however, that a standard medical nomenclature is of sufficient importance to warrant the formation of a committee composed of the various national agencies interested for the special purpose of developing a uniform nomenclature . . . .

We further believe that the use of standard tables of statistics, such as those suggested, the filing of such reports with a central agency, such as the Hospital Library and Service Bureau, and the compilation of the accumulated statistics would make available a volume of accurate data concerning hospitals that would be of great value to the hospital field.[2]

The reader will recall in our discussion of patient records that this lack of a uniform system of sickness nomenclature was cited as one of the major difficulties in making patient statistics valuable for purposes of management. As pointed out by the committee of the American Hospital Association, a uniform system of medical nomenclature is further necessary for the development of scientific research in hospital problems.

The need for better reports is well recognized throughout the hospital field, and a great deal has been written on the subject.[3]

[2] The Hospital Library and Service Bureau of the American Conference on Hospital Service, 22 East Ontario Street, Chicago, furnishes much interesting statistical and other information on hospital service in the United States, and suggestions relative to hospital reports.

[3] Carl E. McCombs, "A Clinic on Hospital Reports," *The Modern Hospital*, Vol. XXII (1924), pp. 270, 378, 584; Vol. XXIII (1924), pp. 59, 132, 239. By same author, "The Educational Value of Hospital Reports," *The Modern Hospital*, February, 1919.

Briefly summarized, the conclusions of all who have given thought to the matter are:

1. There should be an annual report published in sufficient numbers to furnish its use by public officials, citizens, and others interested in hospital facts.

2. As far as possible, it should in its form and in the arrangement of its material conform to the standards approved by the American Hospital Association.

3. If hospital reports are to serve the purposes of publicity and education, they should be designed to improve their attractiveness and promote their appeal. In other words, they should have the effect of arousing citizens' interest in hospital affairs and in health promotion generally.

Educating the Patient and His Family

To take full advantage of the opportunity for public education which the hospital has through contact with the individual patient and his family, its service must be such as will convince the patient of its competency to deal with his personal needs and its concern for his welfare. It goes without saying that the professional care of the patient should be as good as the hospital finances and other resources permit. But the hospital that would make best use of the patient as a medium for public education must consider other elements of its service in his behalf. The impression that the hospital gives the patient is not dependent entirely upon the efficiency of the treatment given. Treatment may not conform to the highest standards of practice, and its results may not be all that the patient hoped for, but if the hospital is so conducted as to appeal to the patient's sense of order, decency, and justice, and to increase his respect for his government and its agencies, he is likely in the future to give more thought to his own responsibility for what his government is and does.

Cleanliness, discipline, and order—these are essential to good management of any institution, and of special significance in the health educational program which the hospital should carry on. The patient in a public hospital may have little conception of what personal cleanliness means; he may not appreciate the importance of discipline in his personal affairs; he may not be able to recognize order from disorder in his private life and environment. He will, however, recognize and appreciate their lack when

he is a patient in a hospital with ample opportunity to observe conditions about him, and with the sharp sensitization of his mental and nervous faculties which sickness so often produces. It ought not to be necessary to emphasize the need of cleanliness, discipline, and order in a hospital, but even the most casual observer will find in many hospitals evidences of their lack which will shock him.

One of the most common causes of criticism of public hospitals, and a criticism often justly made, is that the patient, because he is a public charge, is not given the same courteous and kindly care that the private hospital patient receives. The public hospital attendants and employees too often assume that because the patient is a charity patient whose care is furnished at public expense, his personal reactions to the hospital regimen are of no particular importance. But the very fact that the patient is a public charge and, therefore, dependent on his government for relief, puts upon public authorities a responsibility for service to him far weightier even than that which the private hospital has for its paying patient. The private patient who pays knows that he has a right to have what he pays for, and he is likely to insist upon it. The public dependent patient feels that because he does not pay, he must take what is offered, not knowing or appreciating that what is offered may be less than he is entitled to as one who directly or indirectly pays for it in taxes. He has a right to expect and demand courtesy and kindness as well as efficient treatment; if he fails to receive these, the hospital loses an opportunity to educate him and his family. The efficiency of public hospitals has suffered greatly because of the officiousness, rudeness, or downright abuse of the self respect of patients by hospital attendants, not alone because such action hampers the professional treatment of the patient, but because it results in the failure many times of patients to seek needed public hospital service, except as a last resort.

The Hospital Ambulance in Its Relation to Patient Education

The first contact between the patient and the hospital is often the determining contact with respect to the patient's impression of the hospital service and his education in health. If the patient comes in the hospital ambulance, and ambulance procedure offends his sense of propriety, a bad impression may be created which even the best later care cannot eradicate. That the patient should

receive proper medical care and treatment, if treatment is needed, by ambulance attendants needs no particular comment here. But apart from these strictly professional phases of ambulance service, the contact between the patient and the hospital which is made by the ambulance and its attendants merits consideration with respect to its adaptability to patient convenience, comfort, and mental state. First, ambulance service should be as prompt as possible in all cases. Delay, even though delay may not cause the patient physical suffering, often causes him mental distress and annoyance and is to be avoided, if on no other ground than the impairment of the hospital's educational influence upon the patient. Second, the ambulance should be of such type and equipment as will impress the patient with the hospital's concern for his welfare. It is not uncommon, in many cities, for public hospitals to depend upon ambulance service provided by the police, and, in some cities, the ambulance is nothing but a patrol wagon equipped for moving sick persons. But whether the ambulance is a patrol wagon or a more elaborate affair bearing police insignia, it is not likely to appeal to the sick patient as a proper vehicle for his use. If attended by police officers only, as is often the case where a police department is responsible for ambulance work, the patient is likely to feel that he is being dealt with as a police "case" rather than as a hospital patient, and this offends his sense of propriety. The hospital ambulance service should, if possible, be under the complete control of the hospital so that there will be no confusion in the minds of the public as to its status, and no conflict of authority in its operation for the good of the sick patient.

The ambulance should be built and equipped for the transportation of the sick and their proper care in transit. It should be as comfortable for the patient's transfer as it can be made, and so equipped that the removal of the patient to and from the ambulance can be accomplished with the least possible exposure of the patient, either to the hazards of removal or to the gaze of the curious. To be "taken away in the ambulance" is an ordeal for even the most insensitive patient, and his right to have this done with the least possible mental or physical discomfort should be recognized.

It would seem unnecessary to say that within the ambulance the equipment should be as complete as the professional care of the patient requires, and as clean and orderly as it is possible

to make it. An unwholesome and uncomfortable bed which has not been properly renovated since its previous use, dirty or torn linen and blankets, unclean or otherwise unsuitable instruments and other accessories are more common defects of public hospital ambulance equipment than one might suppose. The ambulance patient, if conscious, is often in a particularly sensitive mental state. Any unnecessary annoyances or discomforts, or any neglect of the obvious proprieties will be observed and remembered by the patient to the discredit of the hospital, and any evidences of the hospital's regard for his comfort and ease will be remembered to its credit.

The Admitting Office as a Factor in Patient Education

The admitting office of the hospital or of the dispensary, if the patient comes first as a dispensary patient, is the first point of contact for those not ambulance patients. Here again is a place where courtesy, tact, and sympathy is highly important, though frequently lacking. The admission of the patient to the public hospital is often regarded as a more or less perfunctory duty which is entrusted to an admitting clerk whose chief interest is carrying out the necessary routine of registration. The most satisfactory plan, however, provided the hospital has a social service division, is for the patient to be first interviewed by a trained social worker who can by judicious inquiry elicit all the facts necessary for registration of the patient and, at the same time, overcome his natural fear of what is before him. If it is not practicable for the social worker to see the patient on his entrance to the hospital, he should be visited as soon after admission as possible, and assured of the hospital's interest in his welfare and that of his family. His duties and privileges as a hospital patient should be fully explained to him, and advice given him about the effect which his personal deportment will have upon his recovery. This type of service is essentially educational, but it contributes as well as to the avoidance of difficulties in management for which the uninformed patient may be largely responsible. The contact early established by the social worker with the patient should be continued throughout the latter's hospital career. If it has been based on an intelligent appraisal of the patient's needs, medical, social, and economic, and implies a sympathetic purpose in meeting them, its educational effect can hardly be measured. Teaching the patient means teaching his family, and teaching his family

means teaching the community. It is clearly impossible to know how or what to teach unless the patient's circumstances and capacity for instruction are thoroughly understood, and it is impossible really to instruct unless patient and hospital instructor are *en rapport.*

Other Phases of Patient Education

The patient, during his hospital career, may find cause for complaint of one kind or another. If these complaints, whether with cause or without, are ignored, the patient is inclined to discount the hospital's interest in him. It is an adage in public hospital service that the charity patient is a great complainer. This statement is not unwarranted, but it must be remembered that the public hospital patient has more reason to complain of his lot than his fellow sufferer, the noncharity patient, who has fewer economic worries to add to that of his physical or mental ailment. The public hospital that dismisses the patient's complaint without thorough inquiry is doing both itself and the patient a disservice. The efficient hospital manager knows that although many patients' complaints are not justified, many are the results of defects in hospital procedure which need correction. The patient may be a mere troublemaker, but to ignore his complaint only tends to make him more troublesome. Whether the complaint is found on inquiry to be justified or unjustified, it is good for the morale of both patient and hospital staff to have responsibility put where it belongs and disciplinary measures taken against the patient or hospital attendants as necessary. A patient's complaint should, in all cases, be dealt with not by the person complained of, but by his superior officer. If so dealt with, any complaint can be utilized as a means of educating the patient.

It seems a far cry from the care of the patient's clothing to his education, but the relation between these two hospital activities is not as remote as may appear. The public hospital patient frequently reaches the hospital with his clothing in bad condition, particularly so if he has been in an accident. Routine procedure in most public hospitals is to take the patient's clothing, as soon as he has been admitted, bundle it into a bag and store it away until the time comes for his discharge. If the patient has no other clothing, he is compelled many times to leave the hospital in the same clothes in which he entered, but even more disreputable because they have been bundled up and stored away uncleaned

and unrepaired. The self-respecting patient who is obliged to leave the hospital looking like a tramp is not likely to feel great respect for those who send him forth. Certainly no patient can leave the hospital under such circumstances without feeling that he has been badly dealt with. In the best hospitals, public and private, considerable attention is given to the care of patients' clothing, and the result upon the morale of the departing patient more than justifies the cost of the service.

Educating the Average Citizen

No matter how well planned and carefully edited a hospital report may be, its use is bound to be limited mainly to public officials, professional workers, and others who have some familiarity with hospital practice and procedure. There are relatively few citizens who have sufficient knowledge of what a hospital does, or is supposed to do, to permit them to make an intelligent appraisal of its service from the hospital report. The "average citizen" has, naturally enough, an inclination to avoid intimate contact with the public hospital except when he is sick and in dire need. So his knowledge of it and its work is, in the main, merely an impression gathered from the newspapers, the statements of public officials, casual conversation, and his own observations of the hospital from the outside. He knows, perhaps, that the hospital is a place chiefly for the care of paupers, and usually the only criticism he is inclined to venture as to its efficiency is that it "costs too much." Charges of "hospital extravagance" and "hospital abuse" may stir his interest occasionally, but he rarely takes any definite action to satisfy himself of the truth or falsity of the charges.

If the hospital is to reach the average citizen and educate him so that he may understand better what the hospital does and what it ought to do, it must provide for some better means of information than the hospital report or the criticism of other uninformed citizens. Among the private hospitals, personal contact between the public and the hospital is frequently provided by hospital auxiliaries made up of representative men and women of the community who view the hospital and its work from the inside, aid in developing public support for it, advise its management as to needs which seem inadequately met, and offer such suggestions on nontechnical phases of hospital work as may be warranted.

Such an auxiliary or advisory council, though rarely established in connection with public hospitals, might well be established for all. If composed of representatives of the various organizations and associations of the community and citizens at large in whom the public has confidence and whose aim is to promote the social and economic welfare of the city, it could be utilized as a medium for the health education of the masses. An advisory council of citizens, whose interests in hospital affairs are nonpolitical, could also do much to influence nonpolitical action by public officials, not only in matters of budget, but in matters of hospital personnel. A means is thus afforded to make articulate that indefinable thing which we call public opinion, which at present, with respect to public hospital service, represents merely individual opinion based upon scanty, incomplete, and inaccurate information of hospital aims and methods.

The following excerpt presents a picture of hospital management which is by no means as rare in public hospitals as it ought to be. How deterrent such conditions are to community health education, as well as to efficient professional care of the sick, needs no explanation.

The hospital presents a particularly untidy and unkempt appearance. Lack of discipline and order is everywhere evident. Several internes were seen smoking in that part of the hall where visitors are received. Other internes were seen carrying lighted cigars through the corridors and wards. The emergency room attendant was smoking a pipe in the hall and in the emergency room, the chef was smoking a pipe while preparing meals, and a dishwasher was also smoking a pipe over the dishes which had just been washed. Two of the hospital staff informed the examiner that they had observed attendants to stop to light their cigarettes while carrying patients on stretchers.

In the room where food was being prepared for employees, doctors, and nurses, a dust pan full of sweepings was lying on the floor under the serving table, and three uncovered garbage cans stood in the corner of the room. The floor of the room was unclean and two cats were wandering about.

Windows all over the hospital were dirty and apparently had not been washed for several weeks, and dust was found on ledges, window sills, and fixtures. On the roof of one of the corridors were seen four dirty, broken-down beds with mattresses soiled and apparently unfit for anything but burning. One of the employees stated that these beds were not in use.

A room in the basement, which is occupied by employees, was very dirty. Soiled clothing was lying about on beds and chairs; the bed linen was dirty and ragged.

There are no elevators in the building, and the investigator saw an intoxicated man, who had just been brought in by the ambulance on account of an injury to his head, being dragged up the stairs by two attendants. Patients must be carried up the stairs and down the stairs on stretchers at serious risk.

No provision is made for the cleaning and sterilization of patients' clothing. Clothing when taken from patients is rolled in bundles, tagged and stored in the basement until needed. The result is that patients leaving the hospital are obliged to wear clothing which is unclean and so wrinkled that the patient has no respect for himself or the hospital.

The kitchen, which is in the basement, is poorly equipped and maintained. There are no baking ovens and all bread is purchased from local bakers. The kitchen range is in bad repair and very dirty. The wooden floors are in poor condition, and the walls and ceilings are cracked and dirty.

Laundry equipment is also in bad repair. All laundry work has recently been discontinued on the ground that the cost of new apparatus and of maintaining the laundry force would be greater than having the laundry done by private concerns . . . .

No waiting room for visitors is provided. Visitors are required to sit at one end of the main ground floor corridor, which is also used as a lounging place for internes and other employees. Smoking is not prohibited, and for a visitor to be required to wait in this place, where several internes are sitting about smoking, cannot fail to be sometimes a source of annoyance and discomfort to the visitor.

These are but a few of many indications of incompetent management and the lack, on the part of public authorities, of a sense of their responsibility to the community.[4]

The Health Education of Hospital Physicians

Except in the relatively few hospitals, chiefly in the largest centers of medical teaching, where the hospital is affiliated with a medical school, public hospitals have contributed very little to the medical education. Whether or not the hospital has such affiliation with a teaching institution, it has an important educational function to perform which, if properly performed, will do much to promote community health education generally. The public hos-

[4] New York Bureau of Municipal Research, *Report on a Survey of Certain Departments of the City and County of Denver, Colorado,* 1914 (printed), pp. 114-115, 117.

pital commonly has three groups of physicians for whose education and training it has definite responsibility, namely (1) the interne or house staff which is composed, ordinarily, of recently graduated physicians whose practical training in hospital work is regarded as a desirable extension of their medical college instruction; (2) the attending medical staff of the hospital which is made up commonly of a small group of the practising physicians of the community who give their services free, and are responsible directly for the medical care and treatment of patients and the supervision of the medical work of internes; (3) the members of medical profession, as a whole, who have a direct general interest in common with all other citizens in the work of the public hospital, and a direct special interest in the promotion of all services for the betterment of health and the advancement of medical science.

With respect to the education and training of the hospital interne, the hospital can be said to have two motives. The first is to make him capable of filling his place in the hospital organization to the best advantage of hospital and patient. The second is to qualify him for his future work as a medical practitioner and health advisor. The interne's medical training must be entrusted mainly to the physicians of the medical staff who supervise him. Usually, the course of interne training follows a more or less fixed plan of routine assignments to various phases of hospital medical work under supervision, but formal instruction by members of the medical staff is rarely provided for in public hospitals at least. The amount of actual training given the interne depends largely upon the ability of the interne to make himself personally agreeable to his supervising medical attending physicians and surgeons. If he does so, he may be given much more instruction and much more responsibility than his fellow interne who is not so agreeable personally, although perhaps fully as efficient. This is but natural, of course, but it is not a satisfactory plan for the training of internes.

To develop a plan for the formal training of internes, which will give the desired results in training without interfering too greatly with routine and necessary hospital work, is a difficult matter, particularly in public hospitals where the number of internes is rarely more than that necessary to carry on routine work. The best thought on the matter is that, when possible, paid assistants should be employed to do much of the routine work which internes are now called upon to do, in order that the

latter may be given definite courses of instruction, just as pupil nurses are trained in their training schools while being utilized for part of their time in routine hospital work. This thought implies that the course of training for internes shall be given in conjunction with nurse training. Whether the training of internes is formalized to this extent or not, the public hospital should, as far as it practicable to do so, work out in coöperation with its medical staff, a plan of instruction of internes which will be suited to the hospital's special requirements. Such a plan should provide for the following:

1. The preparation by the hospital superintendent and medical staff of a manual covering such general and special orders as are to be carried out by internes in their routine work, and in their relations with members of the medical staff, nurses, hospital employees, and patients.

2. Demonstrations of special operative and other therapeutic procedures to the interne group by members of the attending staff, and assignment of internes to carry out similar procedures as occasion warrants.

3. Periodic conferences and clinics between the internes and medical staff for the discussion of "case" problems and other matters of mutual interest.

4. The assignment of internes to research and report on special medical problems appearing in their work.

5. The maintenance, for the benefit of the interne, of a good working library of standard text books and current periodicals.

These features of a program of interne training can be provided in lieu of more formal instruction, without great expense and without requiring a great amount of the time, either of internes or members of the medical staff.

With respect to the education of members of the attending staff, little need be said. If the opportunities for physicians to add to their knowledge of sickness and its treatment are lacking because of inadequate hospital equipment, it is probable that their performance will be routine and perfunctory. If, on the other hand, the hospital makes available to their use the material and equipment for scientific research and the betterment of their technique in diagnosis and treatment, they will be likely to avail themselves of the opportunities offered. A well organized system of patient records, efficient diagnostic laboratory service, well equipped and operated X-ray service, a good medical library, if one is not

elsewhere available, a systematic effort to secure autopsies, especially in obscure cases, with adequate reports of autopsy findings, a place for the medical staff to meet for conference and discussion—these are a few of the many facilities which ought to be placed at the disposal of the medical staff. It is rare indeed, except in the largest public hospitals, to find that public authorities have made any consistent effort to provide for the benefit of the medical staff much more than a place for the treatment of patients, some patients to be treated and the minimum equipment needed for routine work. The public hospital ranks far below the private hospital in the opportunities which it affords its attending physicians to broaden their experience and improve their technique. This is one reason, and a major one, why public hospitals do not attract the most competent physicians of the community to their staffs, and it explains in part why public hospitals generally have lower standards of service.

The responsibility of the public hospital as an educational service for the benefit of the medical profession generally can only be met satisfactorily when the provilege of utilizing hospital facilities is made available to all, or as many as possible of the reputable practitioners of the community. In most public hospitals, the attending medical staff is limited to a few physicians of the community who are continuously "on service," or who arrange among themselves for a certain rotation in service. It is desirable, of course, to have a definite group of physicians who can be depended upon at all times to furnish the medical attendance and supervision necessary, but in order that as many physicians as possible may be given the educational opportunities of the hospital, some hospitals have invited all reputable physicians of the community to become members of a so-called "courtesy" staff. Such members, though having no definite assignments for attendance at the hospital, are regarded as members of the staff and are invited to use the hospital facilities as far as this may be done without disturbance of routine. Appointments to the active attending staff may then be made from the "courtesy" staff as vacancies arise. This plan has much to commend it, particularly in public hospitals.

Where there is a dispensary connected with the hospital, it is usually the case, as already noted, that the attending staffs of the hospital proper and of the dispensary are practically independent, except that the chief attending physicians and surgeons are required to act as supervisors of dispensary work. Closer coördination of

hospital and dispensary medical work, and a unification of their respective medical staffs in one general organization, gives better opportunity for the hospital to secure wider coöperation of the physicians of the community in hospital work. Large numbers of physicians may be invited to serve in the dispensary, in one capacity or another, and if service in the dispensary carries with it definite recognition of dispensary physicians as members of the hospital staff, dispensary appointments are more desired and, therefore, more readily filled. Given a combined hospital dispensary medical staff in which provision is made for several graduations in rank, it is possible for a hospital to attach a large number of physicians to its service, and from the point of view of education of physicians, the more the better. The only limitation as to numbers of staff physicians which a public hospital needs to recognize is the limitation which the size and character of the hospital service necessarily imposes and the need of reasonable continuity of medical service. The chief objection to having so many physicians on the attending medical staff is that under the plan of rotation of service, previously described, changes in medical personnel may come too frequently for the welfare of the patient, or for the good of the staff as a whole. But the advantage to the public hospital of enrolling large numbers of practitioners as members of the regular and "courtesy" staffs more than offsets this objection.

The interest of physicians in the hospital may be cultivated otherwise through the local medical society or societies. We have mentioned the desirability of having a general advisory or auxiliary committee of citizens which may visit the hospital, study its problems and make recommendations to its administrative officials as to hospital betterment. In such a committee, there should be some physicians, and these physicians should be properly accredited representatives of their medical society of the city or county. This relationship between the hospital and the medical society makes it possible for the latter to keep closely in touch with hospital policy and program, and to express the common and official judgment of the medical profession on these matters.

The Health Education of Hospital Nurses

We have already discussed the training school for nurses as an element in the hospital organization. We shall, therefore, consider here the training of nurses only in its relation to the problem

of community health education and the hospital's share in this work. The trained nurse has come to be recognized as the most effective agent in the promotion of community health and welfare, and the opporunities for her in the field of sickness prevention are even greater than in the more limited field of hospital or private sickness treatment. Trained nurses are needed in every city for the prevention of communicable diseases, the protection of the health of children, and in health inspectional and investigational work of great variety. In a few cities, it has been found possible so to adjust the curriculum of the hospital nurse in training that she may be given assignments for practical field work in disease prevention under the supervision of the health officer of the city. As a rule, however, it is impossible to make such arrangement because of the already overlooked curricula of the training schools. In the recent report on nursing and nursing education by the special committee previously referred to, the conclusion was reached that while it was quite practicable to improve the training of nurses by regular instruction and course in the principles of preventive medicine and public hygiene, public health training for nurses could be better done in post graduate training schools.

Unquestionably post graduate training in public health work would be highly desirable for all graduate nurses who go into public health nursing, but for a long time to come the ranks of public health nurses will have to be recruited, as in the past, from trained nurses who have had no such post graduate experience. The public hospital which maintains a training school for nurses can, however, do a great deal to develop the nurse's interest in preventive health service and to give her some familiarity with its practical problems. Through coöperation between the health authority and the hospital, arrangement can be made for health talks to nurses by representatives of the health department and for moving picture and other exhibits of a health educational nature. The hospital nurses can be assigned to occasional field trips with health department inspectors or nurses, and opportunity given them to become familiar with health organization and functions. They can and should in all cases be given opportunity to learn more about the problems of the sick than they can possibly learn by merely attending those who are confined in hospital beds. If there is a dispensary connected with the hospital, they should have definite assignments to dispensary work so that they may become familiar with methods of dealing with the ambulatory or outdoor

patient, and with the social and economic problems of the sick poor. They should understand what medical social service means and what its application is to prevention and treatment of disease.

The success of the hospital's health educational program is probably best gauged by the character of the product of its training school for nurses. If after a course of two or three years, the public hospital trained nurse does not have thorough understanding of the basic principles of sickness prevention and their application, regardless of how skilled she may be in sickness treatment, the hospital has not fulfilled its educational mission. The nurse who is not fitted to teach health to her patients and to the community, is no more than half equipped, whether she remains in hospital work or finds her place elsewhere.

CHAPTER XXII

HOSPITAL PLANNING AND ITS ADMINISTRATIVE IMPORTANCE

Every community is confronted at some time or other with the problem of how best to extend existing public hospital facilities to meet new service demands, or to conform more closely to the higher ideals of hospital work set during the past few years. Is a new hospital needed, and if so, of what type and what capacity? Where should it be located and how should it be constructed? How should it be planned so that future needs can be met with greatest economy? These and many other questions must be asked by the community and answered intelligently. Otherwise, the public may be committed to a hospital program not warranted by community need, or poorly adapted to a need existing, or anticipated.

Whatever may be the opinion of public officials or prominent citizens with respect to what the community needs in the way of hospital service, their opinions, if not based upon thorough study of all the facts, are likely to be erroneous. In other words, before any one is competent to form an opinion on the subject, a survey should be made of the sickness needs of the particular community and the facilities already available for meeting them. "Hopeful and useful as may be the experiences of other people in other places, the determination of how much and what shall be used must depend upon the actual facts in the local community." [1]

Estimated Hospital Bed Requirements Per Unit of Population

Before considering the various special studies which should be made before decision can be reached with respect to how much and what kind of hospital service is really necessary, it is perhaps worth while to note certain facts of common experience regarding the hospital bed requirements for a given unit of population. Under normal conditions the total number of hospital beds required per

[1] Edward A. Fitzpatrick, "Interrelationships of Hospital and Community," *The Modern Hospital,* February, 1925.

1,000 population does not vary widely from city to city. Accepted practice is to estimate 5 beds per 1,000 population as ordinarily adequate for the care of general medical and surgical patients, maternity patients, and children. It is estimated that there should be in addition 5 beds per 10,000 population for communicable diseases, and as many beds for tuberculous patients as there are deaths in the year from the disease. It should be noted, however, that in preparing such estimates, the population served by the hospitals and not the population of the city proper should be used as the basis. If the city has a large suburban area inadequately provided with hospital service, the population of this suburban area or such part of it as may be found utilizing city hospitals, should be added to the urban population. For example, a city of 100,000 population with a suburban population of 10,000 served by all city hospitals would need the following for the total 110,000 people:

For general medical and surgical patients (5 beds per 1,000)	550 beds
For communicable diseases (5 beds per 10,000)	55 beds
For the tuberculous (assuming that there were 100 deaths annually in the population group)	100 beds
	705 beds

An approximation to this figure may be reached at in another way. From reports of "sickness surveys" by the Metropolitan Life Insurance Company, and other surveys of a similar nature, it may be estimated that rarely less than 2 per cent of the population of a given community are sick at all times, and that about 15 per cent of these can be expected to seek hospital care. To be on the safe side and allow some margin for local variations, let us assume the total daily number of sick persons to be 2.5 per cent of the population and that 20 per cent of these sick are in need of hospital service, whether seeking it or not. There would then be in the hospital community of 110,000 population an average daily number of 2,750 sick persons, of which number 550 would probably need hospital care. To provide hospital care for 550 sick persons daily would require considerably more than that number of beds, since due to the daily income and outgo of patients

the average hospital is rarely able to utilize its beds to more than 80 per cent of actual capacity. To accommodate satisfactorily 550 patients daily there would be needed in the neighborhood of 700 hospital beds, which fairly approximates the estimate of 715 beds previously made.

Estimates so made are to be regarded merely as suggestive, not as a final basis for actual appraisal of local needs. If local facilities are much below or above the figures obtained by such estimates, the fact would be significant only in indicating the need for further study of the problem. Where public health educational work has been extensively carried on, where hospital facilities are of high standard and wider use of them has been encouraged by private physicians, and where there are particular health hazards increasing the general need for hospital services, such estimates as have been made would probably be too low. For example, there is extremely wide variation among cities with respect to the utilization of hospitals by maternity patients. In some cities as high as 65 per cent of maternity patients are accustomed to seek hospital care; in other cities less than half this number make use of hospitals. In industrial centers where there are larger numbers of foreign born workers with relatively low incomes, and accustomed to the services of midwives as birth attendants, the number of maternity patients seeking hospital care will likely be less than among populations with higher standards of living and different customs.

Special Studies of Community Hospital Need

To determine exactly, or at least as near to exactness as possible, what a community really needs in the way of hospital service, the following studies at least should be made:

1. The efficiency of disease preventive work, in other words, the efficiency of the health department or bureau. If preventable diseases are not prevented as far as this has been made possible by the application of known and proven scientific methods, obviously, the need of hospital service will be increased. The first step in reducing the need for hospital beds is to see that all possible means are utilized to prevent people from being sick.

2. The amount of sickness in the community. Reliable data on this subject is best obtained by a house to house canvass, either of the entire community, if it is a small one, or a representative part of it, if it is so large as to make a complete survey imprac-

ticable. The sickness rate determined for a representative part of the community, assuming no exceptional or unusual disease conditions, can be safely applied to the city as a whole.

3. The bed equipment of the various hospitals of the community and the extent to which they are utilized by the sick. In this connection, it should be remembered that satisfactory use of hospital equipment requires that the number of beds shall be considerably in excess of the daily patient enrollment. Eighty per cent utilization of hospital beds is about as much as can be expected, but many hospitals are not so arranged and equipped as to permit even this degree of utilization of beds.

4. The availability of other than hospital services for the care of the sick, public and private. If adequate facilities for outdoor care of the sick in their homes and in dispensaries are not available, the hospital demand is likely to be greater. These services include those of physicians, nurses, midwives, as private practitioners, or as representatives of public and private agencies.

5. The use of general hospital beds by special types of patient. If, for example, it is found that in the general hospitals of the community there are large numbers of chronic invalids, and aged and infirm, who require long periods of bed care and for whom no other facilities are available, it is clear that the maximum possible utilization of hospital bed capacity cannot be provided. Ten hospital beds for the care of patients with acute diseases or injuries might accommodate twenty or more patients in the course of a month, but ten beds occupied by chronic invalids or aged infirm might accommodate no more than that number of such patients in the same or longer period. The same is true, though in a less degree, of convalescent patients. If hospital beds are occupied by convalescents, more acutely ill patients may be denied opportunity to use them. The important thing in a study of this kind is to determine whether or not the hospital facilities are such as to permit efficient utilization by those who need hospital care most, namely, the injured and acutely ill.

6. The allotment of hospital facilities for the sick poor ("public charges") who can pay nothing, and for those who can pay, and the extent of utilization of beds by these two patient groups. It frequently happens that the allotment of hospital beds in a given community is not adapted to the local need. The total number of beds may apparently meet the required standard per unit of population, but beds whose use is limited to those who can pay the full

charge for service, may show a low percentage of utilization, while those free or at low rates may show a percentage of use higher than is desirable.

Decision regarding the hospital bed requirement of the community is one which ought not to be reached hastily, and this is particularly important from the standpoint of the taxpayer. Many times complaints of overcrowding of public hospitals are accepted at face value without due consideration of the circumstances of the complaint. Many public hospitals are not so arranged as to permit maximum use of equipment. A complaint of overcrowding may result because there is overcrowding of a particular department or unit of the hospital service, when other departments or units are not being uitlized to more than half of their capacity. This may indicate the need for alterations in the existing hospital plant rather than need for a larger plant. Hospitals have been built and equipped at great cost without anything more than the most casual information on the need for them, and without a plan of construction adapted either to existing or future needs. Municipal governments have been, perhaps, the most serious offenders in this respect. On the belief that economics may be effected under municipal operation, public hospitals have been built to provide services which could be more satisfactorily provided through the utilization of existing private hospitals, whose services, as we have said, are almost invariably of higher standard than those of public hospitals.

Hospital Location; Accessibility an Essential

In many instances, one finds institutions for the care of the sick, and particularly public institutions, sadly handicapped by the failure of those responsible for their development to give due weight to the question of location. It is true that political exigencies and the limitations of the municipal budget sometimes force city officials to take action with respect to the location of public institutions for the sick, which they probably would not endorse under other circumstances. Many times, in order to show an initial economy in the selection of a site, public officials have committed the community to a program of ultimate extravagance. There are many factors of expediency to be considered in determining the location of a public institution for the sick, which do not have the same compelling force upon private institutional authorities. In the private institutions, which serve mainly those

able to pay, location is not perhaps such an important factor; their patients take little thought of transportation problems. The private institution is further not hampered in its planning and development by political considerations, nor in its financing is it always compelled to consider so carefully the taxpayers' purse. But leaving out of consideration for the moment all questions of expediency, political or otherwise, the chief factors of location of public institutions for the sick which may be regarded as having primary influence upon administrative efficiency are: (1) accessibility, and (2) environment.

With respect to the first of these factors it must be remembered that the public hospital deals mainly with a group of the population whose knowledge of scientific medical progress is limited, and whose inclination to seek hospital care is tempered not only by ignorance, but also by the usual concomitant of ignorance, fear. Fear of the public hospital, or other institution, is real among the poor, and not altogether without reason. The hospital, or other public institution for the sick, which is near at hand and under more or less daily observation, is in a position to deal more competently with the ignorance of those who need its service. So the location of the public institution for the sick where it can be of real educational value to that part of the public which it proposes to serve, is of prime importance, particularly in the case of the general hospital and its out patient dispensary service, which deals with the injured and acutely ill.

Accessibility is obviously an important consideration in dealing with the emergency needs of the injured and acutely sick of all types. Long or exhausting delay in putting the patient in contact with the physician may seriously retard recovery, if not prevent it. The general hospital and its attached dispensary should, therefore, be so located that it can be reached easily by the population group which it chiefly serves. It need not be in the immediate neighborhood of the patient, but it should not be so far away that long distances have to be traversed by the patient whether he comes on foot, on the street car, or in the ambulance. The out patient department of a general public hospital, if it is to be used to the maximum, must be where it can be used by patients with the least possible inconvenience. The leisure time of the patient who may be expected to utilize the public dispensary is limited. If attendance at the dispensary causes him to lose time from work, takes too much of his leisure time, or costs him something for trans-

portation, he is likely to put off treatment so long that more serious disability results, with consequent greater cost to the community for his restoration to economic independence and usefulness to society.

From the point of view of the attending medical staff of the hospital and dispensary, accessibility is also of considerable significance. The attending physicians are, as a rule, practitioners, who give their services free in the cause of humanity. The hospital, and particularly the public hospital, which must depend upon the voluntary aid of practicing physicians, has a positive responsibility for conserving their time and energy. One of the many reasons why almshouse hospitals generally lack the services of the most competent practitioners is that such hospitals are situated at considerable distance from the centers of population and therefore not easily reached by physicians.

Accessibility is not such an important factor in the location of institutions for chronic invalids and aged infirm, the tuberculous, and convalescents, as in the case of the general hospital and dispensary. For these patients prompt treatment is not so vitally important as for the acutely sick and injured, nor does their treatment demand the same routine and frequent supervision by the medical attendants. Then, too, close contact between the tuberculous or convalescent patient, and his customary environment is generally undesirable. The care of the chronic invalid and the aged infirm presents, in most communities, a difficult problem, because this type of service has been developed most often as a special department of an almshouse, and under the control usually of county authorities. The location of the hospital for such patients is in consequence determined by the location of the almshouse on the "poor farm." This is a decided disadvantage in the promotion of efficient medical care of the chronic invalids and aged infirm by city authorities, not alone because the poor farm is so often under county control and, therefore, not readily fitted into the general municipal program of sickness treatment, but also because of its inaccessibility to physicians and the public. When it is possible to do so, the hospital for chronic invalids and aged infirm should be made a part of the general hospital, as a special pavilion, with all the advantages of accessibility which have been mentioned.

The difficulties incident to the maintenance of high standards of hospital work where the hospital plant is not located with due regard for accessibility, are most strikingly illustrated in the case

of communicable disease hospitals. This is because the communicable disease hospital or pest house has been for many years, and still is, regarded by many otherwise intelligent people as a source of great public danger. The fact that a properly conducted communicable disease hospital is no more dangerous than a public school to dwellers near by is still doubted even by many public officials. Conditions may exist in a remotely situated communicable disease hospital which would not be tolerated in a hospital near at hand and under more or less daily observation. To illustrate this point:

The smallpox hospital, so called, is a small frame building situated in the middle of the open prairie six miles from the city. Accommodations are provided for about nine or ten smallpox patients, there being two small rooms with two beds each, and one large room with six beds. The hospital is in charge of a trained nurse who is apparently capable and efficient. She receives $60 per month and maintenance, and her husband, who assists her, receives $40 per month and maintenance.

The building is in bad condition throughout, and if its use is longer continued, it should be put in good repair. Rooms are heated by stoves and as the building is entirely unprotected from the wind, it is practically impossible to heat all the rooms comfortably in winter and at the same time provide the much needed ventilation. There are no sewer connections, and all waste water and discharges must be carried out of the building and emptied upon the ground or into the outside privy. The bath for patients is in a small shack about 100 feet from the main building; water for patients' baths must be heated on the stove and turned into the bath. Waste water flows out of the tub upon the ground underneath the building.

Medical attention is provided by the deputy health commissioner. When his services are required, he is obliged to make the long trip to the hospital and back, which takes almost two hours.

The smallpox hospital should be abandoned as soon as possible and a separate building should be constructed at the Steele Hospital where smallpox patients may be cared for. There is no more danger in caring for smallpox patients at the Steele Hospital than in caring for other contagious diseases. The idea that smallpox is so dangerous that cases must be cared for in a "pest house" miles away from other human habitation is not in keeping with modern knowledge of contagious diseases. The smallpox hospital should be easily accessible to the patient who is sometimes very ill and to whom the journey of six miles is a severe hardship. It should also be easily accessible

to the visiting physician so that cases may be under daily observation.[2]

Hospital Environment

The second factor in location of public institutions for the sick, which calls for serious consideration by the city government, is that of environment. It may be, and frequently is, a well nigh impossible task to provide satisfactory hospital environment and at the same time conserve the advantages of accessibility. Which of the two factors should determine hospital location under such circumstances, will depend upon the funds available for the site, the transportation facilities of the community, the general adaptation of possible sites to efficient plant operation, the congestion of population, the probable direction of future growth of the city, the necessity for future extensions of institutional capacity, and many other matters, all of which should be given careful study by the city authorities responsible and properly weighted in their conclusions.

The public hospital, and by hospital we mean any institution for indoor care of the sick, should contribute through its environment to the mental and physical restoration of the patient. At the same time it should make such contribution with due regard for economic use of public funds. It is essential for the well being of patients and for efficient use of the plant by doctors, nurses, and others, that there be ample sunlight and fresh air. Preferably, therefore, the institution should not be too closely hedged in by surrounding buildings. Freedom from annoying sights, sounds and odors is desirable, of course, and this means that the hospital shall have sufficient grounds about it to permit protection against such annoyances. It must have room for expansion, for whether or not the rapidity of growth of population indicates a probable need for greater capacity, it is certain that if the hospital fulfills its purpose, more people will seek its service. Adequate provision for outdoor rest and recuperation for patients able to enjoy them, is likewise important, and although the hospital roof is sometimes the only available place for this type of patient, it is better when possible to make available green lawns, trees, flower beds, and walks. Finally, the general outlook of the patient, whether in

[2] New York Bureau of Municipal Research, *Report on a Survey of Certain Departments of the City and County of Denver, Colorado,* 1914 (printed), pp. 108.

bed or out of bed, should be as pleasant as it is possible to make it. Adjacent unsightly buildings, factories, dirty streets, dumping grounds, etc., though perhaps not apparently annoying or distressing to patients, are more of a handicap to good treatment than is commonly realized.

Examples of intelligent planning with respect to municipal hospital environment are by no means many, chiefly because the majority of municipal hospitals were built long before the hospital ideal represented much more than a building to house sick paupers, and at a time when the growth of the community and its need could not be or, at least, was not anticipated. A single illustration of how bad environment hampers hospital efficiency and economy even where its location is otherwise suitable is perhaps sufficient:

> Although the location of the hospital is a desirable one in many respects, there are certain conditions of environment which make life at the institution unpleasant for patients, nurses, and employees. Just east of the institution and across the road is a tannery and when the wind is in the right direction, as it was on the day of visit by the investigator, the odor is distinctly bad. On the west and only a few hundred yards away is a garbage incinerating plant, fortunately not now in use. If ever used, it is almost certain to be a great nuisance to the hospital.
>
> The road on the north of the hospital is unpaved, and as the hospital gets the full sweep of the wind, owing to the lack of surrounding buildings and its position on a height, the dust clouds that sweep across the hospital grounds are more than a mere annoyance. Add to this the fact that the small plaza at the entrance to the grounds and just within the gate is also unpaved, and a condition of dust nuisance is found which results in a decided detriment to the care of buildings of the hospital. The pavilion for diphtheria carriers and the nurses' residence will soon need repairing owing to the effect of the violently blown dust of the street.
>
> It is urged in the interest of economy and comfort of patients and employees that this street be paved to a sufficient extent on both sides of the hospital, and that the plaza at the hospital entrance be also paved. This will practically eliminate the dust nuisance. The tannery should be compelled to remove from this vicinity or eliminate odors. No matter for what purpose the group of buildings may be ultimately used, these matters should be given immediate attention.[3]

[3] New York Bureau of Municipal Research, *Report on a Survey of the Government of the City and County of San Francisco, California,* 1916 (printed), pp. 489.

The Adaptation of Hospital Plant to Hospital Purpose

The hospital plant and its equipment should be so designed, built, and managed, that maximum use of scientific methods and means of treatment will be possible. The situation is quite comparable to that of a commercial manufacturing plant. No matter how skilled its engineers and technicians are, production will be seriously hampered unless the plant and its equipment is scientifically adjusted to their special needs. In industry, this fact has been clearly recognized because the success of the enterprise depends upon the conservation of labor and materials to the last degree. In public administration, however, relatively little thought has been given to the matter, because there is not in public expenditure the same compelling urge to justify every single item of expenditure by its effect upon production and profit. Public institutions for the sick have no fear of bankruptcy proceeding because deficits resulting from uneconomic use of public funds can be readily wiped out by throwing a heavier burden on the taxpayer in the next fiscal period, or by the mere transfer of public funds from other budget allotments. The private hospitals have gone much further in the application of the principles of scientific management than have public hospitals, and so it is that the best planned, best constructed hospitals of to-day are those under private auspices.

The public general hospital in this country finds its origin chiefly in the almshouse infirmary. For this reason it has carried along with it, in perhaps a majority of communities, an almshouse inheritance with respect to plant and equipment which has been a decided handicap to its efficiency. Buildings which were designed and built for the care of sick paupers, who needed a little more attention than was possible to give them in the almshouse proper, are still used as public hospitals to-day in many cities, although they have long since become inadequate to meet modern requirements. When one considers the tremendous advances that have been made in medical science in the past fifty years, it is readily apparent that the type of plant and equipment which may have been suited to the needs of the sick a half century ago is likely to be poorly adapted to to-day's needs. It is, of course, possible, under exceptionally competent medical direction, to get good results in the treatment of patients, even though the plant and its equipment are not what they ought to be, but it is rare indeed to find a public hospital service efficiently conducted with obsolete build-

ings and equipment. Since the public hospital depends for its medical work mainly upon the voluntary services of private practitioners, public authorities should feel a keen sense of their responsibility to furnish physicians with the best possible facilities. This thought needs more than passing emphasis.

The design of public institutions for the sick is to be determined primarily by the nature of the sickness problem with which it expects to deal, whether that of the acutely sick and injured, the chronic invalid and aged infirm, the tuberculous, the convalescent, or others. There are many other factors to be considered such as the adaptation of plant to site and environment, current capacity requirement, possible future expansion, the relations which the particular institutions ought to have with related service units, and finally, the limitation of funds which may be alloted from the public purse for construction and maintenance. With respect to this latter factor, volumes might be written. Time and time again plans for public institutions for the sick have been devised to meet all other requirements except that of financing their construction according to plan. As construction proceded, and as usual at a cost greater than was anticipated, capacity has been cut down, and structural changes made in order to save initial expense which have transformed a good plan into a poor one and made certain future extravagance and waste in operation. Time and again public hospitals have been designed and constructed according to an ideal plan from the standpoint of patient service, but so costly to operate that the community has been under the necessity either of sorely taxing the public purse, or of reducing operating expenses below the limit of efficient maintenance. It is extremely difficult to make this adjustment between plant design and economic operation, but it is not an impossible task, provided adequate study is given to community resources and needs.

Ther are certain principles of design of public institutions for the care of the sick which are of general application, whatever the type of patient service required. These principles find their source in the constant necessity of city governments to maintain many public services and keep expenditures for all within proper bounds. The city government has many things to do, all of which contribute, or should contribute, to community welfare, and some of the things which it has to do are of perhaps even more vital concern than treatment of the sick, important though this is. There is in every field of public service the same need of adapting the machin-

ery of government to newer conceptions of government problems. In consequence, there is a continual increase of public expenditure which must be kept within certain reasonable limits, and which must be apportioned by public officials in such a way that each thing which needs to be done will be provided for according to its relative importance in the whole program of government. The highest possible standards of treatment of the sick should be maintained, but the government should, at the same time, avoid committing itself to an expenditure for hospital construction and maintenance which will not produce commensurate return in public health, and will be likely to jeopardize the development of other necessary health services. Conservation of public funds for hospital purposes requires that:

1. The hospital should be so planned as to keep personal service for operation and maintenance within reasonable limits and permit best utilization of skilled technical workers.

2. It should be so planned that future changes in institutional policy and program, or extensions of service to meet future needs, can be made at minimum cost.

The first of these requirements would seem to be self evident, but, as a matter of fact, experience indicates that it is not so evident to public officials, or, if it is, is frequently ignored for other less important considerations. Hospital service is a type of service in which there is relatively little opportunity for the use of labor saving devices. It is perhaps comparable to a hotel, where personal service plays such an important rôle in management. The ratio between hospital employees and patients varies considerably with the type of service demand as might be expected. The chronic invalids, the tuberculous, and the convalescent need very much less personal attention on the part of employees than the more acutely ill. It is, however, well established that the ratio of employees (including nurses) to beds necessary for adequate service in general hospitals is rarely less than one to one. Since the number of patients is commonly less than the number of beds, the ratio of employees (including nurses) to patients will be somewhat higher—perhaps as high as 1.5 to one. The actual size of the hospital appears to have relatively little bearing on the matter, for substantially the same procedures must be carried out in the small general hospital as in the large one. In special hospitals, such as children's hospitals, maternity hospitals, orthopedic hospitals, etc., the number of employees per bed or per patient is usually con-

siderably lower—rarely exceeding one to one. In hospitals for chronic invalids, the tuberculous, and convalescents, the ratio of employees to patients is rarely more than one-half to one.

It is clear enough that good administration of public institutions for the sick requires that thorough study shall be given to the problem of adapting institutional plan to economic use by employees. If this is not done, high costs of service, without necessarily competent service, will probably result. For example, a public institution may be so built that communication between the various parts of the institution is time consuming because of the distances that must be traveled by nurses and others in their routine work. The result will be a high precentage of lost time on the part of employees and in consequence, a need for a larger number of employees in order to maintain efficient service. Or the hospital may be so planned that an extravagant outlay is necessary for personal service in the maintenance of buildings and grounds. Long corridors mean much cleaning and many cleaners; extensive, highly cultivated grounds require much attention and many attendants; undue extravagance in the allowance of cubic contents of wards and rooms per bed occupant means more workers than the actual sickness need of patients may require. Between the desire for spaciousness and beauty of arrangement, construction, and equipment, and the necessity for economy in the use of public funds, a balance must be struck. It is a serious mistake, but one commonly made, for public officials to depend too largely upon their own judgments in the matter of hospital planning. The advice of the most competent authority on institutional planning should be sought, and if he is furnished with adequate data, on the needs and funds available, the planning of the institution may safely be left to him. The average local architect rarely has sufficient experience in the matter to make his judgment safe, unless he has the advice of a consulting architect with broad experience in hospital planning.

In this connection, some thought may well be given to public hospital capacity in its relation to cost and efficiency. The small public hospital, that is, one of one hundred beds or less, usually costs more per patient day for operation and maintenance than the larger hospital, assuming that the same quality of service is provided in each. The special technical equipment required for general hospital purposes is substantially the same for a hospital of one hundred beds as for a hospital of twice that number of beds. In

other words, with the same, or very slightly increased, facilities needed by a hospital of one hundred beds, in the laboratory, operating room, X-ray room, kitchens, storerooms, engine room, clerical office, etc., perhaps twice that number of beds can be served. Furthermore, the difficulties of maintaining a high type of medical and nursing service in a small hospital are greater and the cost correspondingly higher than in large hospitals. The burden of maintaining a training school for nurses, which is a necessary part of all good hospital organization, also increases in inverse ratio to the size of the hospital. General overhead cost in the hospital of less than one hundred beds usually represents a greater percentage of total cost than in the hospital of 200 or 300 beds.

It is the concensus of opinion among hospital authorities that the capacity of the general hospital should not exceed 500 beds. The same is probably true of other types of institutions for the sick. The best administered hospitals, as far as the writer's experience goes, are those whose capacity is somewhere between 200 and 400 beds. The quality of hospital service generally is not likely to be as high where hospital capacity and the volume of work is so great that the trained hospital executive is unable to give personal oversight to all phases of hospital operation. In the very large hospital, the superintendent is often compelled to confine his attention to minor routine matters which prevent him from applying his skilled direction to more important affairs which are constantly pressing for his attention.

Many illustrations might be offered of well constructed, well equipped and well organized municipal hospitals whose plan is such as to make good maintenance of buildings and good hospital morale difficult, except at a price which the community is not prepared to pay. Two such illustrations are cited:

The San Francisco Hospital is without question a very beautiful one in design and equipment, and capable of rendering most efficient service, but it must be said that it does not lend itself to greatest economy and maintenance. The hospital covers four city blocks, an area 866 feet long and 760 feet wide. This means long distances between pavilions and, consequently, the necessity for a larger force of employees than would be necessary in a more compactly built structure.

This fact is pointed out because it is believed that the tendency toward construction of this type, particularly in municipal hospitals, should be discouraged in the interest of economy. The primary pur-

pose of a municipal hospital is, of course, efficiency of service in the treatment of the sick, but efficiency of service without economy of maintenance has time and again resulted in ultimate inefficiency of service through a failure of appropriating bodies to realize the necessity of furnishing adequate funds for the greater upkeep of such an institution. Any great reduction in the number of nurses or service employees at the San Francisco Hospital would make it impossible to keep the service at par, for the wide separation of various hospital units prevents many employees from doing efficiently the work which might require their presence in more than one unit. In the more compactly built hospital, it is often possible to keep the service at a high mark of efficiency, even with a considerable reduction at times of the number of employees, because the remaining employees may be assigned to extra duties without requiring them to cover any considerable extra amount of territory.

It is true that in conserving space in hospital construction, it is difficult to secure proper lighting and ventilation which is so desirable, and it is also difficult to give the institution the attractiveness of appearance which is a feature of the San Francisco Hospital—but all things considered, the tendency in modern hospital construction is toward such compactness of arrangement as will make for efficient service with the lowest possible labor cost. There is no desire on the part of the investigator to make San Francisco dissatisfied with the San Francisco Hospital. On the contrary, they should be proud of it for it is unquestionably a beautiful institution, and well administered. It is desired, however, in view of the fact that further institutional buildings are contemplated, or will be under contemplation within the next few years, to point out where savings may be made. The most beautiful hospital architecturally is sometimes the most costly to operate.[4]

The General Hospital throughout shows many evidences of efficient management. Buildings and grounds are kept clean; cleanliness, order, and discipline are manifest in every department; equipment is cared for properly and used correctly; supplies are under splendid control, and waste is checked carefully; patients are treated with kindness and consideration; and there is no obvious effort on the part of the hospital management to maintain a high standard of morale among its employees. It can be said without fear of contradiction that there are few municipal hospitals in the country better organized, better managed, and better equipped, and still fewer that

[4] New York Bureau of Municipal Research, *Report on a Survey of the Government of the City and County of San Francisco, California,* 1916 (printed), pp. 458-459.

are able to furnish such generally excellent service at so low a cost. This economy and efficiency of operation is, in spite of the fact that the plan of the General Hospital is not such as to make for such accomplishment. The large number of independent units, with consequently greater wall and floor areas, means larger outlay for repairs and current maintenance; more employees of all kinds are needed for supervision and for detail work; more extensive lines of communication must be maintained; lighting, heating, and other utilities are generally more costly in operation; more equipment of all kinds is needed. Yet, in spite of this plan of hospital construction that demands higher operation costs, careful management has kept such costs well within that generally recognized as essential for efficient municipal hospital service and adequate hospital maintenance. But it is clear that this desirable result could not have been attained but for the relatively low payments for salaries and wages. Many hospital employees are now paid less than a living wage as that is understood in Cincinnati.

It is believed, however, that the point of ultimate economy has been reached at the General Hospital. In fact, it is possible with existing appropriations to make the repairs and replacements currently needed to prevent serious deterioration of the plant. There is a decided lack of personnel for general building maintenance. Many of the buildings are badly in need of paint and repairs to plaster. Equipment needing repairs cannot be taken care of because the mechanical force has been curtailed. Lacking funds even for the purchase of new lighting fixtures, many of the electric lights on buildings and about grounds remain unused. The unkeep of grounds, care of plants and shrubs, new plantings, etc., have been neglected for similar reasons. The signs of deterioration already are beginning to appear in many places. At the time of the investigator's visit, a section of the kitchen ceiling about 50 feet by 20 feet fell, causing serious damage to kitchen equipment. Faulty construction was apparently responsible, and it appears that the balance of the kitchen ceiling is in danger of falling and inflicting even greater damage to equipment and possible injury to workers. The remainder of the kitchen ceiling shows signs even now of cracking away from its attachments.[5]

Planning for the Future

Planning for the future is an important responsibility of public hospital authorities. They must expect that as local conditions change and as medical science progresses, hospital policies and programs will need adjustment. Increase of institutional capacity

[5] Detroit Bureau of Governmental Research, *The Government of Cincinnati and Hamilton County, Ohio,* 1924 (printed), pp. 278.

may be necessary because of the growth of population, the growth of demand for hospital care, extensions of service to special groups not previously regarded as entitled to municipal hospital service, or other reason. The hospital should, therefore, be so planned that these adjustments can be made as required, with the least possible disorganization of the services already established, and at the lowest cost consistent with the needs of patients and the limitation of public funds. This means that the plan shall call for construction in units which may be so related to the administrative and general service departments, that more units up to the desirable maximum can be added without serious interference with those already established and without extensive alterations or additions to the administrative and general service elements of the service. Practically, this comes down to a plan which will provide for a central administrative unit to which other service units are closely connected. To obviate waste of time and other difficulties of communication between the various units, the present tendency is toward a radial arrangement of other units about the central administration unit. Many variations of this radial grouping of the various parts of the plant can be devised without violation of the general principal. The plant may comprise a central unit or hub, about which other units radiate like the spokes of a wheel. It may be of the H type, with the central unit representing the cross bar of the H, and other units the vertical bars. It may be of the L, T, U, or other variation of this basic H plan, the simplest form being the straight line, single unit. The important thing to remember is that the lines of communication between the administrative and general service departments and hospital wards or rooms shall not be extended any farther than is actually necessary to meet capacity requirements.

There has been a general reluctance on the part of those planning hospitals to permit construction above four stories, and some building codes prohibit higher hospital buildings. The fear of fire is largely responsible for this situation, but in these days of fireproof construction and facilities for prompt and easy communication between floors, there is no warrant for insisting upon the four story maximum. Savings in initial cost of site and construction of buildings can be frequently made by building vertically instead of horizontally, and operating costs also can be materially reduced in many cases. The tendency to-day certainly is to build hospitals upward instead of outward and some of the most sci-

entifically planned hospitals of recent years are of the sky-scraper type.

We have indicated that the urge for imposing, capacious, and beautiful hospital buildings not infrequently results in the building of hospitals which are unnecessarily costly, both in construction and operation. These effects of beauty in hospital planning are certainly worth striving for, but they ought not to be provided at the expense of other and more necessary things for the care of the sick. Hospital construction is a problem which requires nice judgment in determining where real economy ends and extravagance begins. Often the most economical material of construction is in the end the most costly because of its relatively rapid depreciation and obsolescence. There are really no substitutes for the best materials in hospital building, yet as the costs of hospital building mount, there is an insistent demand for the substitution of inferior materials. Two considerations are to be met. The first is that since the hospital building is one which lends to relatively rapid deterioration because of the character of its use, materials should be such as to give lasting wear and permit reduction of costs for repairs, replacements, and general maintenance. On the other hand, it must be kept in mind that we are in a period of rapid growth and change, and the hospital must be prepared to meet new conditions and new needs as they become manifest. It would be a serious mistake in hospital construction to make permanence only the ideal, for this might serve, as it has in the past, to perpetuate theories of the responsibility of government for the care of the sick, which are likely to hamper social progress.

Cheap building is never an economy, and yet public officials are constantly facing the question of how to build well and still keep within the limitations of public expenditure which are imposed upon them. The answer cannot be had until the community shall insist, first of all, that the facts about the community need are clearly known and made the basis of the building program. It is better to provide one small institution for the sick which is capable of efficient management and the production of enduring health benefit, than to provide a much larger one, or several, which cannot be satisfactorily maintained. It is far better to serve a few patients well than to attempt to serve a larger number and do it badly. Emergency needs must first be met and if substitutes for highly efficient institutional care must be accepted, let it be done for those patients whose needs are less urgent. Finally, it must

be borne in upon public authorities that the responsibility of government for the care of the sick does not necessarily imply municipal operation of institutions for their care. If private hospital services of high standard are available for use by the city government, they should be used to the limit before there is any venture into the field of municipal operation.

It is clear that there is need for the development of standards of institutional planning and construction which may be adapted as need be to local situations. The American College of Surgeons has, for the past seven years, been conducting surveys of hospitals and laying the basis for standards of method and equipment. Standards have already been recommended for many of the special phases of hospital procedure and these are being quite widely adopted. As yet, however, the majority of municipal hospitals have not attempted to meet fully the standards recommended, probably because their adoption requires betterments of plant equipment which would mean considerably increased expenditure. The American Hospital Association has also done much in coöperation with institutional architects, to promote better hospital planning construction and operation is that they make it possible for local officials to obtain guidance in these technical matters administration of having such uniform standards of institutional planning construction and operation is that they make it possible for local officials to obtain guidance in these technical matters which they could not otherwise obtain except at great expense. Furthermore, the results of work and costs of institutions in which such common standards have been adopted, can be compared intelligently, a thing not possible otherwise.

It is not likely that hospitals in the larger cities generally will ever be maintained exclusively from public funds, that is, from tax revenues. There is evidence that in the smaller and more sparsely settled communities of the country, hospitals, if provided at all, will have to be provided mainly through general taxation of consolidated community areas, as of a county. In such areas the opportunity to utilize private philanthropy for the maintenance of hospitals is naturally much more limited than in the larger centers of population. Wherever it is possible for communities to depend for their needed hospitals upon private philanthropy, with perhaps some aid from government, it is the writer's opinion that it would be better for them to do so. It is a decided mistake for municipal authorities to undertake hospital operation if the

needs of the sick can be met satisfactorily by private hospitals. It is better, we believe, for the city government to levy such tax upon citizens for hospital purposes as will permit the city government to aid private institutions to expand their own services as needed to meet public requirements.

Theoretically at least, the hospital is a public utility which might as well be under municipal control as water supplies, lighting plants, waste disposal systems, etc. But the hospital has in it elements which do not so readily lend themselves to government management. The hospital depends for the care and treatment of patients mainly upon the voluntary services of physicians, practitioners in the community. This service can hardly be measured in dollars and cents. Even if it were possible for the hospital to pay what such service is worth, it is doubtful that the hospital could obtain from a fully paid medical staff as efficient service as it now obtains from an unpaid staff. The most competent practicing physicians of the community, even though payment were offered, would be reluctant to become paid employees of the government, because of the limitations which such employment would place upon their private practices and the freedom of professional work. It is necessary, therefore, that the hospital adapt its entire procedure to the conditions and needs of the private practice of its medical staff. In the operation of no other public enterprises or utilities do we find a similar situation.

Until such time then, as the community is prepared to spend sufficient public money to permit the government to take over the entire hospital service of the community and to develop it according to the highest modern standards, it would better leave the bulk of hospital service to private agencies which have fewer handicaps to contend with in their management of it. There will always be difficulty in financing public hospitals adequately because of the constantly increasing demands upon the taxpayer for other necessary services of government. There will always be some political interference with government enterprises. The public hospital, as essentially a charity hospital, will probably always suffer from the stigma, deserved or undeserved, which attaches to public charity generally.

A Summary of Municipal Hospital Policy

For these reasons and others which have been commented on in our previous discussion of municipal hospital problems,

there are in this country only a few public hospitals, and these chiefly in the largest cities, which are comparable in efficiency with the best private hospitals, except perhaps communicable disease hospitals, which are essentially public services. Higher standards of municipal hospital services can, however, be developed through the general adoption of the principles of hospital planning, organization, and administration set forth in previous pages. Since all of the recommendations made are in a measure applicable to the subject of hospital planning in the larger sense, we may briefly sum up here the conditions which, in the author's judgment, are essential to a good public hospital program.

1. The public hospital program and policy should, if it is to be adapted to community needs and resources, be based upon thorough study of all facts bearing upon these needs and resources. In other words, there should be a survey of the sickness problems of the community and of all existing facilities for the prevention and treatment of sickness.

2. The municipal government should provide only such facilities for the treatment of the sick as are not adequately provided otherwise, in order that there may be no duplication or overlapping of function among the various institutions and agencies concerned, official and unofficial.

3. Where possible, the public hospital system, together with all other services of government for the promotion of public health and welfare, should be administered as a single department of government, preferably under a single administrative officer. The coördination of such related services in one department under single headed control, permits better adjustment of public expenditure to public need.

4. The public hospital system, no matter what its administrative relation to other services of government, should be managed by an experienced and skilled executive, in whom undivided responsibility for hospital operation is vested, subject only to such limitations of his executive authority as may necessarily be imposed by the general administrative organization and program of government.

5. The public hospital system should not limit its service exclusively to the care of dependents (public charges), unless the needs of those not public charges can be adequately met otherwise. The admission of pay patients to public hospitals tends to raise the social and economic level of the patient mass and contributes

thereby to a higher concept of public responsibility for the sick, a most important factor in public hospital betterment.

6. The public hospital should have a well defined educational program for public officials, patients, hospital personnel (including particularly, physicians and nurses), and the community generally. The adoption of such a program implies higher standards for the selection and control of personnel, better organization, better record keeping, and better accounting for public expenditure.

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Throughout the body of the text, references have been made to reports of surveys of public health and hospital administration prepared by the author and his associates in connection with general surveys of municipal government conducted by the New York Bureau of Municipal Research. Most of these reports are, unfortunately, not available for general distribution, and can only be reviewed in their typewritten form at the library of the National Institute of Public Administration, 261 Broadway, New York City. Such of these and other survey reports as have been printed and can be obtained from their offices of publication are, however, included in the list below.

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